Asante

A Communication Division of UIC Corporation

IntraCore® 3624/48

24/48 Port 10/100 + 2/4 Gigabit Ethernet Switch

User's Manual

IntraCore 3624/48

24/48 Port 10/100 + 2/4 Gigabit Ethernet Switch

User's Manual

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Table of Contents

IntraCore 3624/48 2

1.1 Features 7

1.2 System Defaults 8

1.3 Package Contents 11

1.4 Front and Back Panel Descriptions 11

1.4.1 LEDs 13

1.5 Management and Configuration 13

1.5.1 Console Interface 13

Chapter 2: Hardware Installation and Setup 14

2.1 Installation Overview 14

2.1.1 Safety Overview 14
2.1.2 Recommended Installation Tools 15
2.1.3 Power Requirements 15
2.1.4 Environmental Requirements 15
2.1.5 Cooling and Airflow 15

2.2 Installing into an Equipment Rack 15

2.2.1 Equipment Rack Guidelines 16

2.3 SFP Mini GBIC Ports 16

2.4 Connecting Power 17

2.5 Connecting to the Network 17

2.5.1 10/100/1000BaseT Ports Cabling Procedures 17
2.5.2 Gigabit Ethernet Ports Cabling Procedures 18

Chapter 3: Initial Software Setup 20

3.1 Connecting to a Console 20

3.2 Connecting to a PC 22

3.3 Username and Password 22

3.5 Restoring Factory Defaults 23

Chapter 4: Understanding the Command Line Interface (CLI) 24

4.1 User Top (User EXEC) Mode 24

4.2 Privileged Top (Privileged EXEC) Mode 25

4.3 Global Configuration Mode 27

4.3.1 Interface Configuration Mode 28

4.4 Advanced Features Supported within the Command Mode 29

4.5 Using CLI Command History 31

4.6 Using Command-Line Editing Features and Shortcuts 32

4.6.1 Moving Around on the Command Line 32
4.6.2 Completing a Partial Command Name 33
4.6.3 Deleting Entries 33

Chapter 5: Managing the System and Configuration Files 34

5.1 Managing the System 34

5.1.1 Setting the System Clock 34
5.1.2 Specify the Hostname 35
5.1.5 Test Connections with Ping Tests 35
5.1.3 Enable the System Log 35
5.1.4 Displaying the Operating Configuration 35

5.2 Managing Configuration Files 36

5.2.1 Configuring from the Terminal 36
5.2.2 Copying Configuration Files to a Network Server 36
5.2.3 Copying Configuration Files from a Network Server to the Switch 37

5.3 Managing system image Files 38

5.3.1 Saving System image to a Network Server 38
5.3.2 Replacing System image from a Network Server 38

5.4 Configuring SNMP 38

5.4.1 Configuring SNMP Support 39

5.5 Spanning Tree Algorithm 40

5.5.1 Spanning Tree Parameters 40
5.5.2 Rapid Spanning Tree Protocol (RSTP) 41
5.5.3 Configuring spanning-tree 42

Chapter 6: Configuring IP 46

6.1 Establish Address Resolution 47

6.2 Managing IP Multicast Traffic 48

6.2.1 IGMP Overview 48
6.2.2 Configuring IGMP 48

6.3 Access Lists 50

6.3.1 Creating an Access List 50
6.3.2 Configuring an Access List 50
6.3.3 Applying an Access List to an Interface 52
6.3.4 Enabling an Access List 52

Chapter 7: VLAN Configuration 53

7.1 Creating or Modifying a VLAN 53

VLANS can be configured using the following commands: 54

7.2 VLAN Port Membership 54

7.2.1 configuring vlan ports 54
7.2.2 Trunk (IEEE 802.1q) 55

Chapter 8: Scheduling algorithm 57

8.1 Scheduling algorithm 57

8.1.1 Configuring Weighted Round Robin 57
8.1.2 Monitoring Weighted Round Robin 58

8.2 Priority Queuing 58

8.2.1 Priority Mapping 58
8.2.2 Port Based QOS 59
8.2.3 802.1P Based QOS 59
8.2.4 IP Based QOS 59

8.3 Traffic Shaping 60

8.3.1 Configuring Traffic Shaping for an Interface 60

8.4 Rate Limiting 60

Chapter 9: Configuring the Switch Using the GUI 61

9.1 Main Configuration Menu 62

9.2 System 63

9.2.3 System Time Setting 66

Chapter 10: CLI Commands 109

Appendix A: Basic Troubleshooting 138

Appendix B: Specifications 138

Appendix C: FCC Compliance and Warranty Statements 141

C.1 FCC Compliance Statement 141
C.2 Important Safety Instructions 141
C.3 IntraCore Warranty Statement 142

Index 143

Chapter 1: Introduction

The IntraCore IC3624/48 24-port + 2/4 Gigabit Layer 2+ Managed Switch is a high-performance network switch used to reduce network congestion and application response times. The 24-port/48-port IntraCore IC3624/48 multi-protocol switch supports Layer 2+ and Ethernet switching. The switch has 24/48 10/100BaseT ports with Auto-Uplink and has 2/4 combination ports used for sharing with SFP mini GBICs. Fiber technology is used to connect two switches together. The switches also have an SNMP-based management agent embedded on the main board. This agent supports both in-band and out-of-band access for managing the switch.

These switches have a broad range of features for Layer 2+ switching delivering reliability and consistent performance for network traffic. The switches improve network performance by segregating them into separate broadcast domains with IEEE 802.1Q compliant VLANs and provide multimedia applications with multicast switching and CoS services.

The system can operate as a stand-alone network or be used in combination with other IntraCore switches in the backbone.

1.1 Features

The IntraCore IC3624/48 Ethernet switch is a 24-port/48-port Layer 2+ multi-media, multi-protocol (Ethernet and Layer 2+) switch. The following is a list of features:

- 24/48 port 10/100 switch with auto-uplink
- 2/4 port gigabit combo ports
- Supports wire-speed L2+ switching
- CoS provisioning on Layers 2 and 802.1p, IP precedence (TOS, DSCP)
- Packet filtering
- 8K MAC address
- 256 configurable port-based support for 4K VLAN ID, IGMP snooping
- SNMP v1, v2, and RMON, statistics counters supported
- Spanning Tree Protocol 802.1D (standard), 32 instances of 802.1w (rapid) VLAN and 802.1s (multiple)
- 14 trunks and 8 ports/trunk link aggregation
- 4 MB internal packet buffer
- Support for Jumbo Frames (up to 9 KB in length)

1.2 System Defaults

The system defaults are the configuration parameters set in the factory. Use command ‘Clear config’ to restore the defaults.

The following table lists some of the basic system defaults.

Function	**Parameter**	**Default**
Console Port Connection	Baud Rate	Auto
	Data bits	8
	Stop bits	1
	Parity	none
	Local Console Timeout	300 seconds
Authentication	login	Username “admin” Password “Asante”
	Enable Privileged Exec from Normal Exec Level	Username “admin” Password “Asante”
	RADIUS Authentication	Disabled
	TACACS Authentication	Disabled
	802.1x Port Authentication	Disabled
	HTTPS	Disabled
	Port Security	Disabled
	IP Filtering	Disabled
Web Management	HTTP Server	Enabled
	HTTP Port Number	80
	HTTP Secure Server	Disabled
	HTTP Secure Port Number	443
SNMP	Community Strings	“public” (read only) “private” (read/write)
	Traps	Authentication traps: enabled Link-up-down events: enabled
Port Configuration	Admin Status	Enabled
	Auto-negotiation	Enabled

	Flow Control Port Capability	Disabled **1000BASE-T** – 10 Mbps half duplex 10 Mbps full duplex 100 Mbps half duplex 100 Mbps full duplex 1000 Mbps full duplex Full-duplex flow control disabled Symmetric flow control disabled **1000BASE-SX/LX/LH** – 1000 Mbps full duplex Full-duplex flow control disabled Symmetric flow control disabled
Rate Limiting	Input and Output Limits	Disabled
Port Trucking	LACP (all ports)	Disabled
Broadcast Storm Protection	Status Broadcast Limit Rate	Enabled (all ports) 500 packets per second
Spanning Tree Protocol	Status	Disabled
Address Table	Aging Time	300 seconds
Virtual LANs	Default VLAN PVID Acceptable Frame Type Ingress Filtering Switchport Mode (egress mode)	1 1 All Disabled untagged frames
Traffic Prioritization	Ingress Port Priority Weighted Round Robin IP Precedence Priority IP DSCP Priority	0 Queue: 1 2 3 4 Weight: 1 2 4 8 Disabled Disabled

IP Settings	IP Address Subnet Mask Default Gateway DHCP ARP	192.168.0.1 255.255.255.0 0.0.0.0 Client: Disabled Enabled
Multicast Filtering	IGMP Snooping	Disabled
System Log	Remote logging Memory-log Flash-log	Disabled Enabled Enabled
SNTP	Clock Synchronization	Disabled

1.3 Package Contents

The following items are included in the switch's package:

- Switch
- AC power cord
- RS232 straight-through serial cable for management console port
- Rack mount brackets with screws
- IntraCore IC3624/48 CD-ROM

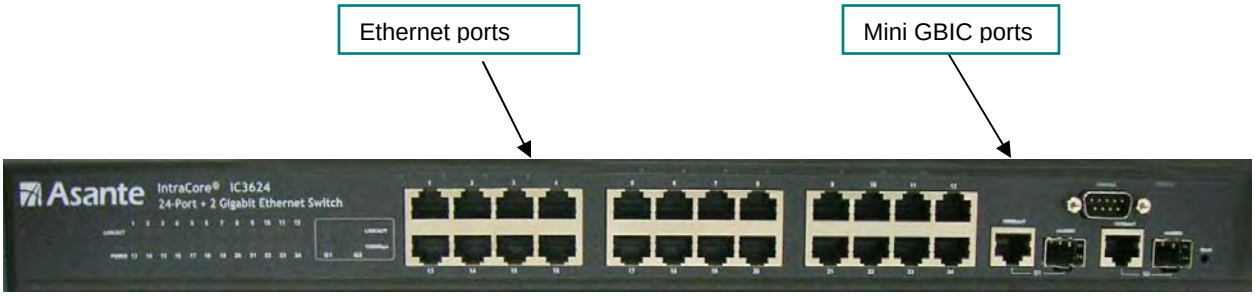
Contact your dealer immediately if any of these items is missing.

1.4 Front and Back Panel Descriptions

The following section describes the front and back panels of the IntraCore IC3624/48 Series switches.

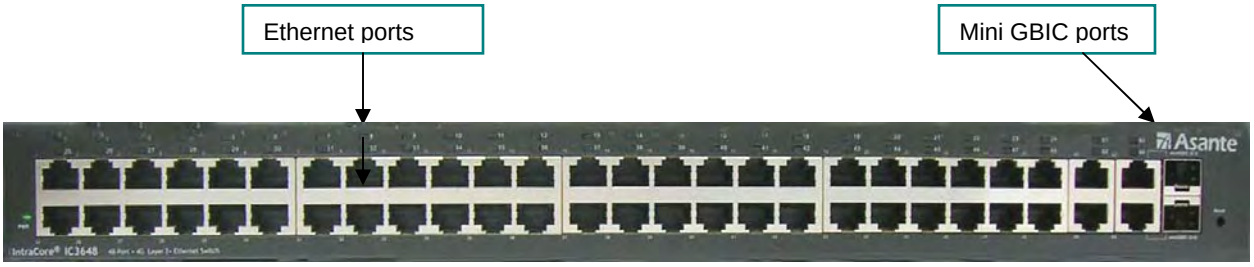
The front panel of the IntraCore IC3624/48 contains the following: power and port LEDs, 24 10/100BaseT ports, and 2/4 dual-function Gigabit ports that support either 1000BaseT or mini GBIC Gigabit Ethernet ports. The console port may be front or back depending on model. For information on LEDs refer to the following section in this chapter.

3624 Front Panel



3624 Rear Panel

3648 Front Panel



3648 Rear Panel

1.4.1 LEDs

The IC3624/48 front panel LED display allows you to monitor the status of the switch.

The IC3624/48 has one power LED indicator. There are also LED indicators for each of the ports. Refer to the following table for LED information.

LED	Color	Description
Power	Green	Power is on.
	Off	Power is off, or main power has failed.
1000MBps	Amber	A valid 1000 Mbps link has been established on the port.
	Green	A valid 10/100 Mbps link has been established on the port.
	Off	No link has been established on the port.
100MBps	Green	A valid 10/100 Mbps link has been established on the port.
	Off	No link has been established on the port.
Link/Activity	Green	A link has been established on the port.
	Blinking Green	Activity has been detected.
	Off	No link has been established on the port.

1.5 Management and Configuration

The switch is managed using Command Line Interface (CLI) in order to access several different command modes. Entering a question mark (?) at each command mode's prompt provides a list of commands.

1.5.1 Console Interface

Support for local, out-of-band management is delivered through a terminal or modem attached to the EIA/TIA-232 interface. You can access the switch by connecting a PC or terminal to the console port of the switch, via a serial cable. The default uername/ password set on the console line is admin/**Asante** (it is case-sensitive). The default IP address is **192.168.0.1**. It can be modified to suit your network setup. See 3.4 for details.

Remote in-band management is available through Simple Network Management Protocol (SNMP) and Telnet client. When connecting via a Telnet session, the default login/password is also **admin**/**Asante** (case-sensitive).

See Chapter 2 for more information on connecting to the switch.

Chapter 2: Hardware Installation and Setup

Use the following guidelines to easily install the switch, ensuring that it has the proper power supply and environment.

2.1 Installation Overview

Follow these steps to install the IntraCore IC3624/48 switch:

1. Open the box and check the contents. See *Chapter 1.2 Package Contents* for a complete list of the items included with the IntraCore IC3624/48 switch.
2. Install the switch in an equipment or wall rack, or prepare it for desktop placement.
3. Connect the power cord to the switch and to an appropriate power source.
4. Connect network devices to the switch.

See the sections below for more detailed installation instructions.

2.1.1 Safety Overview

The following information provides safety guidelines to ensure your safety and to protect the switch from damage.

Note: This information is a guideline, and may not include every possible hazard. Use caution when installing this switch.

- Only trained and qualified personnel should be allowed to install or replace this equipment
- Always use caution when lifting heavy equipment
- Keep the switch clean
- Keep tools and components off the floor and away from foot traffic
- Avoid wearing rings or chains (or other jewelry) that can get caught in the switch. Metal objects can heat up and cause serious injury to persons and damage to the equipment.
- Avoid wearing loose clothing (such as ties or loose sleeves) when working around the switch

When working with electricity, follow these guidelines:

- Disconnect all external cables before installing or removing the cover
- Do not work alone when working with electricity
- Always check that the cord has been disconnected from the outlet before performing hardware configuration

- Do not tamper with the equipment. Doing so could void the warranty
- Examine the work area for potential hazards (such as wet floors or ungrounded cables)

2.1.2 Recommended Installation Tools

You need the following additional tools and equipment to install the switch into an equipment rack:

- Flat head screwdriver
- Phillips head screwdriver
- Antistatic mat or foam

2.1.3 Power Requirements

The electrical outlet should be properly grounded, located near the switch and be easily accessible. Make sure the power source adheres to the following guidelines:

- Power: Auto Switching AC, 90-240 VAC
- Frequency range: 50/60 Hz

2.1.4 Environmental Requirements

Install the switch in a clean, dry, dust-free area with adequate air circulation to maintain the following environmental limits:

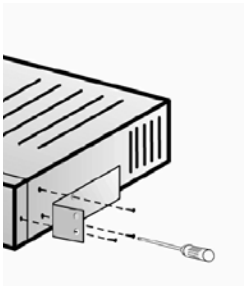
- Operating Temperature: 0° to 40°C (32° to 104°F)
- Relative Humidity: 5% to 95% non-condensing

Avoid direct sunlight, heat sources, or areas with high levels of electromagnetic interference. Failure to observe these limits may cause damage to the switch and void the warranty.

2.1.5 Cooling and Airflow

The IntraCore IC3624/48 switch uses internal fans for air-cooling. Do not restrict airflow by covering or obstructing air vents on the sides of the switch.

2.2 Installing into an Equipment Rack



Important: Before continuing, disconnect all cables from the switch.

To mount the switch into an equipment rack:

1. Place the switch on a flat, stable surface.
2. Locate a rack-mounting bracket (supplied) and place it over the mounting holes on one side of the switch.
3. Use the screws (supplied) to secure the bracket (with a Phillips screwdriver).
4. Repeat the two previous steps on the other side of the switch.
5. Place the switch in the equipment rack.
6. Secure the switch by securing its mounting brackets onto the equipment rack with the appropriate screws (supplied).

Important: Make sure the switch is supported until all the mounting screws for each bracket are secured to the equipment rack. Failure to do so could cause the switch to fall, which may result in personal injury or damage to the switch.

2.2.1 Equipment Rack Guidelines

Use the following guidelines to ensure that the switch will fit safely within the equipment rack:

- Size: 17.5 x 12.7 x 1.8 inches (440 x 234 x 45 mm)
- Ventilation: Ensure that the rack is installed in a room in which the temperature remains below 104° F (40° C). Be sure that no obstructions, such as other equipment or cables, block airflow to or from the vents of the switch
- Clearance: In addition to providing clearance for ventilation, ensure that adequate clearance for servicing the switch from the front exists

2.3 SFP Mini GBIC Ports

The GBIC Interface is the industry standard for Gigabit Ethernet Interfaces.

The Gigabit SFP module inserts into the Mini GBIC port to create a new Gigabit port. The hot-swapping feature on the IntraCore IC3624/48 lets you install and replace the SFP transceivers while the system is operating; you do not need to disable the software or shut down the system power.

To install the module, do the following:

1. Insert the transceiver with the optical connector facing outward and the slot connector facing down. The module is keyed to help establish the correct position.
2. Slide the SFP transceiver into the slot until it clicks into place.
3. Remove the module's rubber port cap.
4. Connect the cable to the Gigabit SFP module's port.

Caution: When replacing a SFP transceiver you must always disconnect the network cable before removing a transceiver.

2.4 Connecting Power

Important: Carefully review the power requirements (Chapter 2.1.3) before connecting power to the switch.

Use the following procedure to connect power to the switch:

- Plug one end of the supplied power cord into the power connector on the back of the switch.
- Plug the other end into a grounded AC outlet.

The power LED show the initialization is in process. The front panel LEDs blink and the power LED illuminates when it has initialized. The switch is ready for connection to the network.

Important: If the power does not come on, check the next section to ensure that the correct cabling is used.

2.5 Connecting to the Network

The switch can connect to an Ethernet network with the switch turned on or off. Use the following procedure to make the network connections:

- Connect the network devices to the switch, following the cable guidelines outlined below.
- After the switch is connected to the network, it can be configured for management capabilities (see the following chapters for information on configuration).

2.5.1 10/100/1000BaseT Ports Cabling Procedures

The 10/100/1000 ports on the switch allow for the connection of 10BaseT, 100BaseTX, or 1000BaseT network devices. The ports are compatible with IEEE 802.3 and 802.3u standards.

Important: The switch must be located within 100 meters of its attached 10BaseT or 100BaseTX devices.

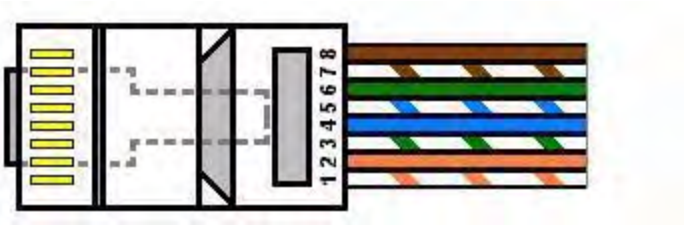
Use the following guidelines to determine the cabling requirements for the network devices:

- Connecting to Network Station: Category 5 UTP (Unshielded Twisted-Pair) straight-through cable (100 m maximum) with RJ-45 connectors
- Connecting to Repeater/Hub/Switch's Uplink port: Category 5, UTP straight-through cable (100 m maximum) with RJ-45 connectors

Note: These switches have no specific uplink ports. All 10/100/1000 ports on these switches are auto-sensing MDI/MDI-X. This advanced feature means that when the ports are operating at 10/100Mbps, they will automatically

determine whether the device at the other end of the link is a hub, switch, or workstation, and adjust its signals accordingly. No crossover cables are required.

Although 10/100BaseT requires only pins 1, 2, 3, and 6, you should use cables with all eight wires connected as shown in Table 2-2 below.



1000BaseT requires that all four pairs (8 wires) be connected correctly, using Category 5 or better Unshielded Twisted Pair (UTP) cable (to a distance of 100 meters). Table 2-2 shows the correct pairing of all eight wires.

Pin Number	Pair Number & Wire Colors
1	2 White / Orange
2	2 Orange / White
3	3 White / Green
4	1 Blue / White
5	1 White / Blue
6	3 Green / White
7	4 White / Brown
8	4 Brown / White

2.5.2 Gigabit Ethernet Ports Cabling Procedures

Cabling requirements for the optional hardware modules depend on the type of module installed. Use the following guidelines to determine the particular cabling requirements of the module(s):

- 1000BaseSX GBIC: Cables with SC-type fiber connectors; 62.5µ multi-mode fiber (MMF) media up to 275 m (902'), or 50µ MMF media up to 550 m (1805')
- 1000BaseLX GBIC: Cables with SC-type fiber connectors; 10µ single-mode fiber media up to 5 km (16,405')
- 1000BaseLH GBIC: Cables with SC-type fiber connectors; 10µ single-mode fiber media up to 20 km (65,617')
- 1000BaseLX Long Haul GBIC: Cables with SC-type fiber connectors; 10µ single-mode fiber media up to 100 km (328,100')

- 1000BaseLZ GBIC: Cables with SC-type fiber connectors; 10µ single-mode fiber media up to 120 km (393,701')
- 1000BaseT: Category 5 or better Unshielded Twisted Pair (UTP) cable up to 100 m (328.1')

When attaching a workstation to the switch, a standard straight-through CAT5 cable may be used, even when the workstation is attached via a patch panel. No crossover cable is needed with the MDX/MDI ports. The switch should be kept off the network until proper IP settings have been set.

Chapter 3: Initial Software Setup

Configure the switch by connecting directly to it through a console (out-of-band management), running a terminal emulation program, such as HyperTerminal or by using telnet.

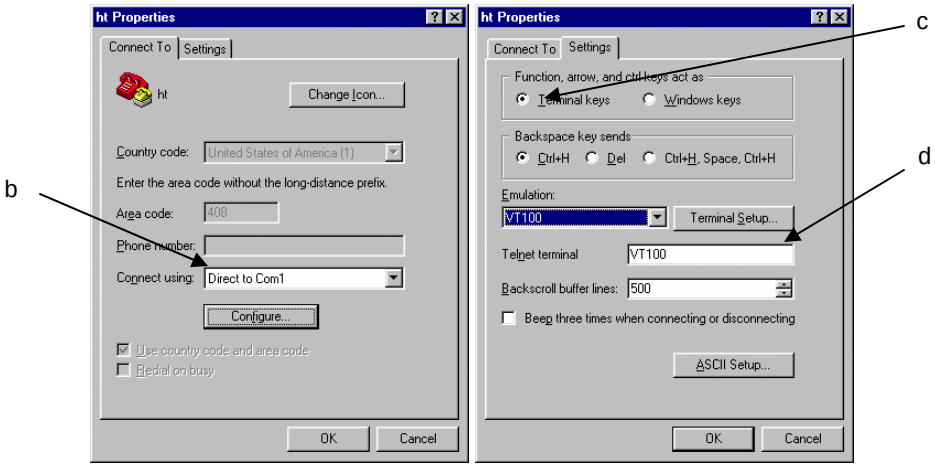
3.1 Connecting to a Console

To connect the switch to a console or computer, set up the system in the following manner:

7. Plug power cord into the back of the switch.
8. Attach a straight-through serial cable between the RS232 console port and a COM port on the PC.
9. Set up a HyperTerminal (or equivalent terminal program) in the following manner:

a. Open the HyperTerminal program, and from its file menu, right-click on **Properties.**

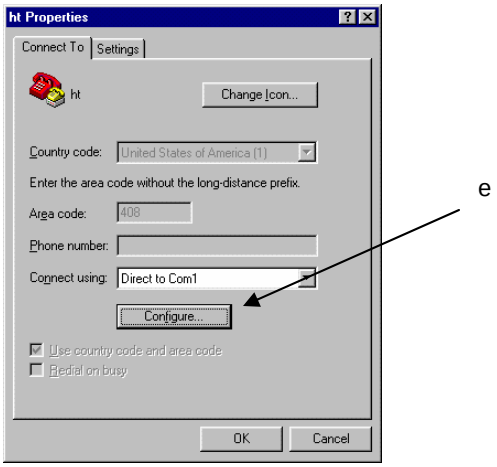
b. Under the **Connect To** tab, choose the appropriate COM port (such as COM1 or COM2).



c. Under the **Settings** tab, choose Select Terminal keys for Function, Arrow, and Ctrl keys. Be sure the setting is for Terminal keys, NOT Windows keys

d. Choose VT100 for Emulation mode.

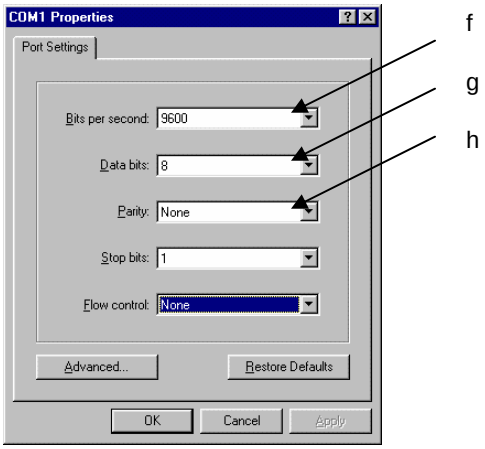
e. Press the **Configuration** button from the Connect To window.



f. Set the data rate to 9600 Baud.

g. Set data format to 8 data bits, 1 stop bit and no parity.

h. Set flow control to NONE.



Now that terminal is set up correctly, power on the switch. The boot sequence will display in the terminal.

After connecting to the console, you will be asked for a password

The initial default password for access using either the console or telnet is Asante (case-sensitive). Refer to the following section for setting passwords on the terminal lines.

3.2 Connecting to a PC

You can connect to the switch through a PC by using either an Ethernet or USB cable. Using a telnet session, you can telnet into the switch. The default IP address is 192.168.0.1. The case-sensitive default password is Asante.

3.3 Username and Password

The default Username/Password is admin/Asante.

3.4 Configuring an IP Address

The switch ships with the default IP address **192.168.0.1/255.255.255.0**. Connect through the serial port in order to assign the switch an IP address on your network.

The physical ports (or switchports) of the IntraCore 3624/48 are L2 ports, and cannot have an IP address assigned to them. By default, each switchport belongs to VLAN 1. Use the following instructions to configure an IP address to the switch. Follow the steps below to change the switch's IP address.

1. Connect to the console and Enter at the Username prompt the username and password as described above.
2. The screen displays the user mode prompt, `COMMAND>`.
3. Type **enable**. Enter username and password. The new prompt is `Switch#`.
4. Type **configuration**. The new prompt is `Switch(config)#`.
5. Type network parms <ip address> <subnet mask> <default gateway>

```
Switch# configuration
Switch(config)# network parms 192.168.0.10 255.255.255.0 192.168.0.254
Switch(config)# exit
Switch# save
Switch# show network
        MAC Address: 00-03-6d-ff-ef-4c
        Management VLAN: 1
        STATIC
        IP: 192.168.0.10
        Netmask: 255.255.255.0
        Gateway: 192.168.0.254
```

3.5 Restoring Factory Defaults

To restore the switch to its factory default settings, follow the commands shown in the following screen.

```
COMMAND> enable
Switch# clear config
Switch# save
```

Important: To retain configuration changes after a system reload you must save changes made in running configuration. From the privileged level, configurations can be saved using the **save** command.

The switch is ready for configuration. Refer to the following chapters for management and configuration information.

Chapter 4: Understanding the Command Line Interface (CLI)

The switch utilizes Command Line Interface (CLI) to provide access to several different command modes. Each command mode provides a group of related commands. In general, after typing a command name, always press 'enter' to start the execution of the command.

After logging into the system, you are automatically in the *user top (user EXEC) mode*. From the user top mode you can enter into the *privileged top (privileged EXEC) mode*. From the privileged EXEC level, you can access the global configuration mode and specific configuration modes: interface and Switch configuration. Entering a question mark (?) at the system prompt provides a list of commands available for each command mode.

Document Conventions

Command descriptions use the following conventions:

- Vertical bars (|) separate alternative, mutually exclusive, elements
- Braces ({ }) indicate a required choice
- **Boldface** indicates commands and keywords that are entered literally as shown
- *Italics* indicate arguments for which you supply values

Access Each Command Mode

The following sections describe how to access each of the CLI command modes:

- User Top Mode: COMMAND>
    - Privileged Top Mode: Switch#
        - Global Configuration Mode: Switch(config)#
            - Interface Configuration Mode: Switch(interface #)#

4.1 User Top (User EXEC) Mode

After you log in to the Switch, you are automatically in user top (user EXEC) command mode. The user-level prompt consists of the 'COMMAND' followed by the angle bracket (>):

```
COMMAND>
```

The user top commands available at the user level are a subset of those available at the privileged level. In general, the user top commands allow you ping remote hosts and show port statistics.

To list the commands available in user top mode, enter a question mark (?). Use a space and a question mark (?) after entering a command to see all the options for that particular command.

Command	**Purpose**
?	Lists the user EXEC commands.
show ?	Lists all the options available for the given command.

User top commands:

```
COMMAND> ?
Help              Displays Help information
?                 Displays Help information
logout            Exit
ping              Pings a remote host
show              Display commands
enable            Enter XCLI interface
```

You may also enter a question mark after a letter or string of letters to view all the commands that start with that letter (with no space between the letter and the question mark). Please note that there is no help on the arguments after a command is typed.

Use ‘logout’ to logout from the switch.

4.2 Privileged Top (Privileged EXEC) Mode

Because many of the privileged commands set the system configuration parameters, privileged access can be password protected to prevent unauthorized use. The privileged command set includes those commands contained in user EXEC mode, as well as the **configure** command through which you can access the remaining command modes. The following example shows how to access privileged EXEC mode. Notice the prompt changes from COMMAND> to *Switch#*:

To execute a command, the command and its arguments or key words must be entered in their entirety. However, a partially typed command, argument or key word can be completed by pressing the ‘tab’ key.

```
COMMAND> enable
Username : admin
Password : xxxxxx
Switch#
```

Command	Purpose
COMMAND> **enable**	Enters the privileged EXEC mode.
Switch# **?**	Lists privileged EXEC commands.

To return to user EXEC mode, use the **exit** command.

To list the commands available in top mode, enter a question mark (?) at the prompt, as shown in the following example. Enter a question mark (?) after a command to see all the options for that command.

```
Switch> enable
Switch# ?
```

```
cable-diag        Proceed cable diagnostic

clear             Command to clear switch configuration or statistics

configuration     Enter into global configuration mode

copy              Upload file from switch to host, or download file to

                  switch from host

exit              Exit current shell

help              Displays Help information

logout            Exit current shell

ping              Proceed ping destination host

reload            Reboot System

save              Save configuration

show              Show configured data

telnet            Telnet the other host
```

Important: To retain configuration changes after a system reload you must save changes made in running configuration. From the privileged level, configurations can be saved using the **save** command.

4.3 Global Configuration Mode

Global configuration commands apply to features that affect the system as a whole, rather than just one protocol or interface. Commands to enable a particular routing function are also global configuration commands. To enter the global configuration mode, use the **configure** command.

The following example shows how to access and exit global configuration mode and list global configuration commands.

Command	**Purpose**
Switch# **configuration**	From privileged EXEC mode, enters global configuration mode.
Switch(config)# **?**	Lists the global configuration commands.

To exit global configuration command mode and return to privileged EXEC mode, use one of the following commands:

Command	**Purpose**
exit	Exits global configuration mode and returns to privileged EXEC mode.

To list the commands available in global configuration mode, enter a question mark (?) at the prompt, as shown in the following example. Enter a question mark (?) after a specific command to see all the options for that command.

```
Switch(Config)# ?

  exit                        Exit current shell

  link-aggregation            Configure link aggregation

  vlan                        Configure VLAN

  arp                         Configure ARP functions

  access-list                 Configure Access-list

  bridge                      Configure switch aging time

  dos                         Configure denial of service

  lacp-syspri                 Configure LACP system priority

  lldp                        Configure LLDP
```

```
  log                          Configure log server
  radius-server                Configure radius server
  static-address               Static address
  mgmt-accesslist              Set management access list, allows up to 8 IP addresses
  monitor                      Configure port mirroring
  dot1x                        Configure 802.1x parameters
  network                      Configuration for inband connectivity
  port-all                     Configure all switch ports
  qos                          Configure QoS
  rmon                         Configure Remote Monitoring
  set                          Configure IGMP and static multicast
  snmp                         Configure SNMP parameters
  sntp                         Configure SNTP
  https                        Configure SSL
  spanning-tree                Configure spanning-tree
  tacplus                      Configure tacacs+
  user                         Change user password
  interface                    Enter into configure interface mode
  green-eth                    Configure Green Ethernet enable or disable
Switch(Config)#
```

From global configuration mode, you can access three additional configuration modes: Use the **interface** command to access its configuration modes.

4.3.1 Interface Configuration Mode

Many features are enabled on a per-interface basis. Interface configuration commands modify the operation of an interface such as an Ethernet or serial port. Interface configuration commands always follow an **interface** global configuration command, which defines the interface type as Ethernet.

In the following example shows configuration of Ethernet interface 1. The new prompt, `Switch(interface 1)#`, indicates the interface configuration mode. In this example, the user asks for help by requesting a list of commands.

```
Switch(Config)# interface 1

Switch(Interface 1)# ?

  exit                      Exit current shell

  dot1x                     Configure 802.1x mode

  lacp                      Configure port LACP mode

  addport                   Add one port to a LAG group

  delport                   Remove a port from a LAG group

  lldp                      Configure lldp port level settings

  admin-mode                Configure administrative mode on a port

  auto-negotiate            Configure auto-negotiate mode on a port

  speed                     Configure port phy parameter

  flow-control              Configure port flow control

  port-security             Configure port security

  qos                       Configure port-based QoS priority mapping

  rate-limit                Configure rate limit on a port

  storm-control             Configure storm control on a port

  rmon-counter              Configure RMON counter capability on a port

  set                       Configure an IGMP router port

  spanning-tree             Configure port spanning-tree

  vlan                      Configure VLAN properties on a port

  interface                 Change to another interface

Switch(Interface 1)#
```

To exit interface configuration mode and return to global configuration mode, enter the **exit** command. To exit configuration mode and return to top mode, use the exit command.

4.4 Advanced Features Supported within the Command Mode

Enter a question mark (?) at the system prompt to display a list of commands available for each command mode. You can also get a list of any command's associated keywords and arguments with the context-sensitive help feature.

To get help specific to a command mode, a command, a keyword, or an argument, perform one of the following commands:

Command	Purpose
Help	Obtain a brief description of the help system in any command mode.
?	List all commands available for a particular command mode.

When using context-sensitive help, the space (or lack of a space) before the question mark (?) is significant. To obtain a list of commands that begin with a particular character sequence, type in those characters followed immediately by the question mark (?). Do not include a space. This form of help is word help, because it completes a word for you.

To list keywords or arguments, enter a question mark (?) in place of a keyword or argument. Include a space before the question mark (?). This form of help is command syntax help, because it reminds you which keywords or arguments are applicable based on the command, keywords, and arguments you already have entered.

Example of Context Sensitive Help

The following example illustrates how the context-sensitive help feature creates an access list from the configuration mode.

Enter the letters “co” at the system prompt followed by a question mark (?). Do not leave a space between the last letter and the question mark (?). The system provides the commands that begin with *co*.

```
Switch# co?
  configuration  Enter configuration mode
  copy       Copy from one file to another
Switch# co
```

Enter the **configure** command followed by a space and a question mark (?) to list the command’s keyword(s) and a brief explanation:

```
Switch# configuration ?
  <cr>
```

Note that in the example below, if you enter the ip command followed by the Return Key or Enter, the system returns the prompt that the command is incomplete.

```
Switch# copy
% Invalid command input
Switch#
```

Generally, uppercase letters represent variables. For example, after entering a command, such as **hostname**, and using a space and a question mark, you will be prompted for the new name, represented by WORD. In cases where an IP address is the variable, the uppercase letters A.B.C.D will represent it.

```
Switch(config)# network parms ?
A.B.C.D             Enter IP address of the switch
```

In the following access list example, seven further options are listed after the question mark. Note that what is typed so far is preserved after the display.

```
Switch(Config)# access-list name acl_1 ?

  add                 Create a new access-list

  action              Specify the action of the ACL entry

  clear               Clear ACL entry contents

  delete              Remove the ACL entry

  enable              Enable the ACL entry

  disable             Disable the ACL entry

  set                 Set ACL entry contents

Switch(Config)# access-list name acl_1
```

4.5 Using CLI Command History

The CLI user interface provides a history or record of commands that you have entered. This feature is particularly useful for recalling long or complex commands or entries, including access lists. To recall commands from the history buffer, use one of the following commands:

Keystrokes/Command	**Purpose**
Press the up arrow key	Recall commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
Press the down arrow key	Return to more recent commands in the history buffer after recalling commands with Ctrl-P or the up arrow key. Repeat the key

	sequence to recall successively more recent commands.

4.6 Using Command-Line Editing Features and Shortcuts

A variety of shortcuts and editing features are enabled for the CLI command-line interface. The following subsections describe these features:

- Moving Around on the Command Line
- Completing a Partial Command Name
- Editing Command Lines that Wrap
- Deleting Entries
- Scrolling Down a Line or a Screen
- Redisplaying the Current Command Line
- Transposing Mistyped Characters
- Controlling Capitalization

4.6.1 Moving Around on the Command Line

Use the following keystrokes to move the cursor around on the command line in order to make corrections or changes:

Keystrokes	**Purpose**
Press the left arrow.	Move the cursor back one character.
Press the right arrow.	Move the cursor forward one character.

Note: The arrow keys function only on ANSI-compatible terminals such as VT100s.

4.6.2 Completing a Partial Command Name

If you cannot remember a complete command name, press the **Tab** key to allow the system to complete a partial entry.

Keystrokes	Purpose
Enter the first few letters and press **Tab**.	Complete a command name.

In the following example, when you enter the letters “conf” and press the **Tab** key, the system provides the complete command:

```
Router# conf<Tab>
Router# configuration
```

The command is not immediately executed, so that you may modify the command if necessary.

You may also enter a question mark (?) to obtain a list of commands that begin with that set of characters. Do not leave a space between the last letter entered and the question mark (?). For example, two commands in privileged mode start with *co*. To see what they are, type **co?** at the privileged EXEC prompt:

Switch# co?

configuration copy

Switch# co

4.6.3 Deleting Entries

Use any of the following commands to delete command entries if you make a mistake or change your mind:

Keystrokes	Purpose
Press **Backspace**.	Erase the character to the left of the cursor.

Chapter 5: Managing the System and Configuration Files

This chapter explains how to manage the system information, as well as how to manage the configuration files for IntraCore 3624/48.

5.1 Managing the System

This section discusses the following tasks needed to manage the system information of the IntraCore 3624/48:

- Setting the System Clock
- Configuring the Host name
- Changing the Password
- Testing Connections with Ping Commands
- Tracing Packet Routes
- Enabling Syslog
- Displaying the Operating Configuration

5.1.1 Setting the System Clock

The IntraCore 3624/48has a battery-backed system clock that is accurate even after a system restart.

```
To manually set the system clock, complete the following commands in privileged
configuration mode. Use a space and a question mark (?) to display the clock set
options. Save after configuring the clock by typing save at the switch# prompt.

Switch(Config)# sntp

  daylight            Enable or disable the daylight saving configuration

  localtime           Configure the local time

  server

  timezone

Switch(Config)# sntp localtime

  enable              Enable local time

  localtime_date      Set local time

Switch(Config)# sntp localtime localtime_date

  <2007..2037>        Enter year

Switch(Config)# sntp localtime localtime_date 2008 07 06 06 35 00

Switch(Config)#
```

5.1.2 Specify the Hostname

The factory-assigned default host name is **Switch**. To specify or modify the host name for the network, use the **Network sysinfo sysname** global configuration command.

Command	Purpose
Network sysinfo sysname *name*	This systems hostname.

5.1.5 Test Connections with Ping Tests

The switch supports IP ping, which can be used to test connectivity to remote hosts, via their IP addresses. Ping sends an echo request packet to an address and "listens" for a reply. The ping request will receive one of the following responses:

- Normal response—The normal response occurs in 1 to 10 seconds, depending on network traffic
- Request timed out—There is no response, indicating a connection failure to the host, or the host has discarded the ping request

Beginning in user mode, use this command to ping another device on the network from the switch:

Command	Purpose
ping *address*	Send an ICMP echo message to a designated host for testing connectivity.

5.1.3 Enable the System Log

The IntraCore 3624/48 sends syslog messages to manager servers. Syslog messages are collected by a standard UNIX or NT type syslog daemon.

Syslog enables the administrator to centrally log and analyze configuration events and system error messages such as interface status, security alerts, environmental conditions, and CPU process overloads.

To log messages, use the following command in global configuration mode.

Command	Purpose
log *address*	IP address of the host to be used as a syslog server.
log facility	Facility parameters for syslog messages.
log trap	Set syslog server logging level.

5.1.4 Displaying the Operating Configuration

The configuration file may be displayed from the EXEC (enable) mode.

To see the current operating configuration, enter the following command at the enable prompt:

```
Switch# show running-config
```

5.2 Managing Configuration Files

This section discusses how to download configuration files from remote servers, and store configuration files on the switch at system startup.

Configuration files contain the commands the switch uses to customize the function of the IC3624/48. The setup command facility helps you create a basic configuration file. However, you can manually change the configuration by typing commands in a configuration mode.

5.2.1 Configuring from the Terminal

The configuration files are stored in the following places:

- The running configuration is stored in RAM
- The startup configuration is stored in nonvolatile random-access memory (NVRAM)

To enter the configuration mode, enter the **configuration** command at the privileged EXEC prompt. The software accepts one configuration command per line. You can enter as many configuration commands as you want.

You can add comments to a configuration file describing the commands you have entered. Precede a comment with an exclamation point (!).

5.2.2 Copying Configuration Files to a Network Server

You can copy configuration files from the switch to a file server using TFTP. You might wish to back up a current configuration file to a server before changing its contents, thereby allowing you to later restore the original configuration file from the server.

Important: TFTP is not a secure protocol. Your server IP address and configuration file name will not be protected over the public Internet. Use TFTP only on a trusted LAN connection.

To specify that the running or startup configuration file be stored on a TFTP network server, use the following commands in the EXEC mode.

The following is an example of copying the current configuration to a file called ‘July’ on server 192.168.123.100.

```
Switch# copy
  nvram_config        Backup switch configuration
  system_image        Backup switch runtime image
  tftp                Download configuration or runtime image from host to switch

Switch# copy nvram_config
  tftp                Specify tftp server

Switch# copy nvram_config tftp
  A.B.C.D             Enter tftp server IP address
```

```
Switch# copy nvram_config tftp 192.168.123.100
  file                Specify a filename

Switch# copy nvram_config tftp 192.168.123.100 file
  WORD                Enter filename for backup configuration


Switch# copy nvram_config tftp 192.168.123.100 file July
  <cr>

Switch# copy nvram_config tftp 192.168.123.100 file July

Switch#
```

5.2.3 Copying Configuration Files from a Network Server to the Switch

You can copy configuration files from a TFTP server to the running configuration of the switch. You may want to do this for one of the following reasons:

To restore a previously backed up configuration file.

10. To use the same configuration file for another switch. For example, you may add another switch to your network and want it to have a similar configuration to the original switch. By copying the file to the new switch, you can change the relevant parts rather than re-creating the whole file.

11. To load the same configuration commands onto all the switches in your network so that they all have the same configurations.

The **copy nvram_config** command loads the configuration files into the switch as if you were typing the commands in at the command line. The switch does not erase the existing running configuration before adding the commands unless a command in the copied configuration file replaces a command in the existing configuration file. For example, if the copied configuration file contains a different IP address in a particular command than the existing configuration, the IP address in the copied configuration is used. However, some commands in the existing configuration may not be replaced or negated. In this case, the resulting configuration file will be a mixture of the existing configuration file and the copied configuration file, with the copied configuration file having precedence.

To copy a configuration file from a TFTP server to the switch, use one of the following commands in EXEC mode:

Command	**Purpose**
Switch# copy tftp 192.168.123.254 file cfg_file nvram_config	Copy the config file ‘cfg_file’ from a TFTP server 192.168.123.254 to the switch.

To clear the saved configuration and restore configuration to default values, use the following command from privileged mode:

```
Switch# clear config
```

Don't forget to use '**save'** command to preserve the new configuration across reboots.

5.3 Managing system image Files

This system image file is stored in the non-volatile flash in the switch. It is the software that runs in the switch after power up. It provides user interfaces (CLI, Web, telnet) for user to control and manage the switch. The following describes the commands that save the system image to a file in a host TFTP server and download a new version system image from a TFTP server to the switch.

5.3.1 Saving System image to a Network Server

You can save the system image file of the switch to a file server using TFTP. You might wish to back up the current system image file to a server , thereby allowing you to later restore the original system image from the server in case of system image file corruption.

To save the system image file of the switch to a TFTP server, use one of the following commands in EXEC mode:

Command	**Purpose**
copy system_image tftp 192.168.0.254 file ttt sysimg_file	Copy the system image the file 'sysimg_file' to TFTP server 192.168.0.254.

5.3.2 Replacing System image from a Network Server

You can replace the system image file of the switch from a file in a server using TFTP. You can update the current system image with a newer version in this fashion.

To replace the system image file of the switch from a TFTP server, use one of the following commands in EXEC mode:

Command	**Purpose**
copy tftp 192.168.0.254 file new_sysimg system_image	Copy the system image the file 'new_sysimg' from TFTP server 192.168.0.254 to the switch.

5.4 Configuring SNMP

This section discusses the following tasks needed to configure Simple Network Management Protocol (SNMP).

5.4.1 Configuring SNMP Support

The Simple Network Management Protocol (SNMP) system consists of three parts: an SNMP manager, an SNMP agent, and a Management Information Base (MIB). SNMP is an application-layer protocol that allows SNMP manager and agent stations to communicate. SNMP provides a message format for sending information between an SNMP manager and an SNMP agent. The agent and MIB reside on the switch. In configuring SNMP on the switch, the relationship between the manager and the agent must be defined.

The *SNMP agent* gathers data from the *MIB*, which holds the information about device parameters and network data. The agent also responds to the manager's requests to get or set data. An agent can also send unsolicited traps to the manager. Traps are messages alerting the SNMP manager to a specific event on the network. Such events include improper user authentication, restarts, link status (up or down), closing of a TCP connection, or loss of connection to a neighboring switch. An *SNMP manager* can request a value from an agent, or store or change a value in that agent.

To configure support for SNMP on the switch, perform the following tasks:

- Create an SNMP user group

Command	**Purpose**
Switch(Config)# snmp group add read_grp version 1 access ro	Create a 'read_only' version 1group 'read_grp'

- Create an SNMP user of the group just created

Command	**Purpose**
Switch(Config)# snmp user add user_read group read_grp version 1	Create a version 1 user 'user_read' of group 'read_grp'

- Create a community string and management station

Command	**Purpose**
snmp community add public group read_grp mgmt-ip 192.168.123.100	Create a community string 'public' for group 'read_grp' that can be used by management host 192.168.123.100

- Define SNMP Trap Operations

Command	Purpose
snmp trapstation add 192.168.123.100 community public type linkchange trap-version 1	Create a trap host 192.168.123.100 to which the switch can send version 1 link change trap messages using community string 'public'.

5.5 Spanning Tree Algorithm

The Spanning Tree Protocol (STP) is part of the IEEE 802.1D standard. It provides for a redundant network without the redundant traffic through closed paths. For example, in a network without spanning tree protocol, the same message will be broadcast through multiple paths, which may start an unending packet-passing cycle. This in turn causes a great amount of extra network traffic, leading to network downtime. The STP reduces a network like this, with multiple, redundant connections, to one in which all points are connected, but where there is only one path between any two points (the connections span the entire network, and the paths are branched, like a tree).

All of the bridges (a switch is a complex bridge) on the network communicate with each other using special packets of data called Bridge Protocol Data Units (BPDUs). The information exchanged in the BPDUs allows the bridges on the network to do the following:

- Elect a single bridge to be the root bridge
- Calculate the shortest path from each bridge to the root bridge
- Select a designated bridge on each segment, which lies closest to the root and forwards all traffic to it
- Select a port on each bridge to forward traffic to the root
- Select the ports on each bridge that forward traffic, and place the redundant ports in blocking states

5.5.1 Spanning Tree Parameters

The operation of the spanning tree algorithm is governed by several parameters.

Forward Time

After a recalculation of the spanning tree, the Forward Time parameter regulates the delay before each port begins transmitting traffic. If a port begins forwarding traffic too soon (before a new root bridge has been selected), the network can be adversely affected. The default value for Forward Time is 15 seconds.

Hello Time

This is the time between BPDUs transmitted by each bridge. The default setting is 2 seconds.

Maximum Age

Each bridge should receive regular configuration BPDUs from the direction of the root bridge. If the maximum age timer expires before the bridge receives another BPDU, it assumes that a change in the topology has occurred, and it begins recalculating the spanning tree. The default setting for Maximum Age is 20 seconds.

Note: The above parameters (Hello Time, Maximum Age, and Forward Time) are constrained by the following formula:

(Hello Time + 1) <= Maximum Age <= 2 x (Forward Delay – 1)

Priority

Setting the bridge priority to a low value will increase the likelihood that the current bridge will become the root bridge. If the current bridge is located physically near the center of the network, decrease the Bridge Priority from its default value of 32768 to make it become the root bridge. If the current bridge is near the edge of the network, it is best to leave the value of the Bridge Priority at its default setting.

In general, reducing the values of these timers will make the spanning tree react faster when the topology changes, but may cause temporary loops as the tree stabilizes in its new configuration. Increasing the values of these timers will make the tree react more slowly to changes in topology, but will make an unintended reconfiguration less likely. All of the bridges on the network will use the values set by the root bridge. It is only necessary to reconfigure that bridge if changing the parameters.

Port Priority

The port priority is a spanning tree parameter that ranks each port, so that if two or more ports have the same path cost, the STP selects the path with the highest priority (the lowest numerical value). By changing the priority of a port, it can be more, or less, likely to become the root port. The default value is 128, and the value range is 0–255.

Port Path Cost

Port path cost is the spanning tree parameter that assigns a cost factor to each port. The lower the assigned port path cost is, the more likely that port will be accessed. The default port path cost for a 10 Mbps or 100 Mbps port is the result of the equation:

Path cost = 1000/LAN speed (in Mbps)

Therefore, for 10 Mbps ports, the default port path cost is 100. For 100 Mbps ports, it is 10. To allow for faster networks, the port path cost for a 1000 Mbps port is set by the standard at 4.

5.5.2 Rapid Spanning Tree Protocol (RSTP)

Rapid Spanning Tree Protocol makes use of point-to-point link type and expedites into a rapid convergence of the spanning tree. Re-configuration of the spanning tree can occur in less than 1 second (as opposed to 50 seconds with the default settings in the legacy spanning tree), which is critical for networks carrying delay-sensitive traffic, such as voice and video.

Port Roles and the Active Topology

RSTP provides rapid convergence of the spanning tree by assigning port roles and by determining the active topology. RSTP uses the same underlying spanning tree calculation and algorithm as legacy STP to select the bridge with the highest bridge priority (lowest numerical priority value) as the root bridge. Then RSTP assigns one of these port roles to bridge ports:

- Root port—provides the best path (lowest cost) when the bridge forwards packets to the root switch.

- Designated port—connects to the designated switch, which has the lowest path cost when forwarding packets from that LAN to the root bridge. The port through which the designated switch is attached to the LAN is called the designated port.

- Alternate port—offers an alternate path toward the root switch to that provided by the current root port.

- Backup port—acts as a backup for the path provided by a designated port toward the leaves of the spanning tree. A backup port can exist only when two ports are connected together in a loop-back by a point-to-point link or when a switch has two or more connections to a shared LAN segment.

- Disabled port—has no role in the operation of the spanning tree.

A port with the root or a designated port role is included in the active topology. A port with the alternate or backup port role is excluded from the active topology.

Rapid Convergence

RSTP provides for rapid recovery of connectivity following the failure of a switch, switch port, or LAN. It provides rapid convergence for edge ports, new root ports, and ports connected through point-to-point links as follows:

- Edge ports—If a port on a switch running RSTP is assigned to be a edge port, it will be put to forwarding immediately. However, the edge port will be in the RSTP initialization state and will send out the RSTP BPDUs with the operating status of edge port set to TRUE. If the edge port starts receiving the BPDUs, it will change the operating edge state to FALSE and start the spanning tree calculations. It is recommended to assign any ports that are to be left as a “leaf” of the LAN (with no connection to any bridge) as edge ports.

- Root ports—If the RSTP selects a new root port, it blocks the old root port and immediately transitions the new root port to the forwarding state.

- Point-to-point links—If you connect a port to another port through a point-to-point link and the local port becomes a designated port, it negotiates a rapid transition with the other port by using the proposal-agreement handshake to ensure a loop-free topology.

Note that if the link type of the port is not forced, the switch makes the decision of link type by operating duplex mode of the port. Also, a port with full-duplex mode is considered as a point-to-point link type, and a port in half-duplex mode is set as shared link type.

5.5.3 Configuring spanning-tree

Enabling/Disabling Spanning-tree

Use the configuration mode command below to enable/disable spanning tree on the switch.

Command	**Purpose**
spanning-tree forceversion 8021w	Enable Rapid spanning-tree(802.1W) on the switch.
spanning-tree forceversion none	Disable spanning tre on the switch

Configuring Switch/Bridge Priority

For <*priority*> the range is 0 to 61440 in increments of 4096; the default is 32768. The lower number is used when you want to specify the switch as the root switch.

Valid priority values are 0, 4096, 8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152, 53248, 57344, and 61440. All other values are rejected.

Command	**Purpose**
spanning-tree priority 8192	Set switch priority to 8192

Configuring Link Type

Use the following interface mode command to configure port link-type:

Command	**Purpose**
spanning-tree port force-p2plink enable ports 1-2	Set link type of port 1,2 to point to point

By default, the link type is determined from the duplex mode of the interface: a full-duplex port is considered to have a point-to-point connection; a half-duplex port is considered to have a shared connection.

To return the switch to its default setting, use the **following** configuration command.

Command	**Purpose**
spanning-tree port force-p2plink auto ports 1-2	Set link type of port 1,2 to auto

Configuring an Edge Port

Use the following interface mode command to configure port link type:

Command	**Purpose**
spanning-tree port edge enable ports 1-2	Set port 1,2 to edge port

The default setting is no edge port configuration.

To return the switch to its default setting, use the **following** configuration command.

Command	Purpose
spanning-tree port edge disable ports 1-2	Set port 1,2 to non edge port

Configuring Port Path Cost

Use the following interface mode command to configure port path cost:

Command	Purpose
spanning-tree port cost 1000 ports 1-2	Set path cost of port 1,2 to 1000

The default values for path cost are determined by the operating port speed:

- For ports operating in 1000Mb speed, the path cost is 20000
- For ports operating in 100Mb speed, the path cost is 200000
- For ports operating in 10Mb speed, the path cost is 2000000

To return the switch to its default setting, use the **following** configuration command.

Command	Purpose
spanning-tree port cost 0 ports 1-2	Set path cost of ports 1,2 to default values

Configuring Port Priority

Use the following interface mode command to configure port priority:

Command	Purpose
spanning-tree port priority 10 ports 1-2	Set priority of ports 1,2 to 10

For <*port-priority*>, the range is 0–240 in increments of 16; the default is 128. The lower the number, the higher the priority.

Chapter 6: Configuring IP

The Internet Protocol (IP) is a packet-based protocol used to exchange data over computer networks. All other IP protocols are built on the foundation. IP is a network-layer protocol that contains addressing and control information that allows data packets to be routed.

The table below lists the traditional classes and ranges of IP addresses and their status.

Class	Address or Range	Status
A	0.0.0.0 1.0.0.0 to 126.0.0.0 127.0.0.0	Reserved Available Reserved
B	128.0.0.0 to 191.0.0.0 255.255.255.0	Available
C	192.0.0.0 to 223.255.255.0	Available
D	224.0.0.0 to 239.255.255.255	Multicast group addresses
E	240.0.0.0 to 255.255.255.254 255.255.255.255	Reserved Broadcast

With the rapid expansion of networks being connected to the Internet, critical problems were seen with the traditional classified addressing scheme. It was possible that IP addresses would run out, and routing tables would be overwhelmed. Thus, the Classless Inter-Domain Routing (CIDR) addressing scheme was created.

CIDR replaces the older process of assigning IP addresses with general prefixes of 8, 16, or 24 bits. CIDR uses prefixes of 13 to 27 bits. A CIDR address includes the standard 32-bit IP address and adds information on how many bits are used for the network prefix. In the IP address 206.203.1.35/27, the “/27” indicates that the first 27 bits are used to identify the unique network, and the remaining bits are used to identify the specific host. Now, blocks of addresses can be better fitted to even very small or very large networks.

The following table describes the Class C equivalent of CIDR prefixes.

CIDR Prefix	Class C Equivalent	Host Addresses
/27	1/8 Class C	32 Hosts
/26	1/4 Class C	64 Hosts
/25	1/2 Class C	128 Hosts
/24	1 Class C	256 Hosts
/23	2 Class C	512 Hosts
/22	4 Class C	1,024 Hosts
/21	8 Class C	2,048 Hosts
/20	16 Class C	4,096 Hosts

/19	32 Class C	8,192 Hosts
/18	64 Class C	16,384 Hosts
/17	128 Class C	32,768 Hosts
/16	256 Class C OR 1 Class B	65,536 Hosts
/13	2,048 Class C	524,288 Hosts

6.1 Establish Address Resolution

A device in the IP can have both a local address (which uniquely identifies the device on its local segment or LAN) and a network address (which identifies the network to which the device belongs). The local address is more properly known as a *data link* address because it is contained in the data link layer (Layer 2 of the OSI model) part of the packet header and is read by data link devices (bridges and all device interfaces, for example). The more technically inclined will refer to local addresses as *MAC addresses*, because the Media Access Control (MAC) sub-layer within the data link layer processes addresses for the layer.

To communicate with a device on Ethernet, you first must determine the 48-bit MAC or local data link address of that device. The process of determining the local data link address from an IP address is called *address resolution.* The IntraCore 3624/48 software uses the Address Resolution Protocol (ARP) for address resolution. ARP is used to associate IP addresses with media or MAC addresses. Taking an IP address as input, ARP determines the associated media address.

Once a media or MAC address is determined, the IP address/media address association is stored in an ARP cache for rapid retrieval. Then the IP datagram is encapsulated in a link-layer frame and sent over the network.

6.2 Managing IP Multicast Traffic

Multicast traffic is a means to transmit a multimedia stream from the Internet (a video conference, for example) without requiring a TCP connection from every remote host that wants to receive the stream.

Traditional IP communication allows a host to send packets to one host (unicast transmission) or to all hosts (broadcast transmission). IP multicast provides a third scheme, allowing a host to send packets to a group of hosts (group transmission). A multicast address is chosen for the members of a multicast group. Senders use that address as the destination address of a datagram to reach all hosts of the group. The stream is sent to the multicast address, and from there, it is delivered to all interested parties on the Internet. Any host, regardless of whether it is a member of a group, can send to that group. However, only the members of the group receive the message.

The IntraCore IC3624.IC3648 supports the snooping of Internet Group Management Protocol (IGMP) messages that are used between hosts on a LAN and the switch(s)/routers on that LAN to track the multicast groups of which hosts are members. The switch supports IGMP Version 2 that has such features as the IGMP query timeout and the maximum query response time.

6.2.1 IGMP Overview

The Internet Group Management Protocol (IGMP) manages the multicast groups on a LAN. IP hosts use IGMP to report their group membership to directly connected multicast switches. Switches executing a multicast protocol maintain forwarding tables to forward multicast datagram's. Switches use the IGMP to learn whether members of a group are present on their directly attached sub-nets. Hosts join multicast groups by sending IGMP report messages.

IGMP uses group addresses, which are Class D IP addresses. The high-order four bits of a Class D address are 1110. Therefore, host group addresses can be in the range 224.0.0.0 to 239.255.255.255.

The address 224.0.0.0 will not be assigned to any group. The address 224.0.0.1 is assigned to all systems on a sub-net. The address 224.0.0.2 is assigned to all switches on a sub-net.

Forwarding Unknown Multicast Packets. Unknown multicast packets are those packets with destination IP multicast addresses not learned by the switch. By default, the switch forwards all such traffic.

6.2.2 Configuring IGMP

Use the following commands to configure IGMP.

Enable the IGMP Snooping

To enable/disable IGMP, use the command below. Unknown multicast traffic will not be forwarded once igmp is enabled.

Command	Purpose
Set igmp {enable | disable}	Enable/Disable IGMP

Enable the IGMP querier

Multicast switches can send IGMP host-query messages to discover which multicast groups are present on attached networks. These messages are sent to the all-systems group address of 224.0.0.1 with a time-to-live (TTL) value of 1.

Multicast switches continue to periodically send host-query messages to refresh their knowledge of memberships present on their networks. If, after some number of queries, the switch software discovers that no local hosts are members of a multicast group, the software stops forwarding onto the local network multicast packets from remote origins for that group and sends a prune message upstream toward the source.

The switch can be configured to send IGMP queries which are used to solicit IGMP hosts report messages. The switch uses the report messages to keep track of which ports belong to which IP multicast group.

To enable/disable IGMP querier , use the command below:

Command	**Purpose**
set igmp-querier {enable | disable}	Enable/Disable IGMP querier

Modifying the IGMP Host-Query Message Interval

Multicast switches elect a designated switch for the LAN (subnet). The designated switch is the one with the highest IP address. The switch is responsible for sending IGMP host-query messages to all hosts on the LAN. By default, the designated switch sends IGMP host-query messages every 60 seconds in order to keep the IGMP overhead on hosts and networks very low. To modify this interval, use the following command in interface configuration mode:

Command	**Purpose**
set igmp query-interval <*10-3600 seconds*>	Configure the frequency at which the designated switch sends IGMP host-query messages.

The following example shows setting the IGMP query interval to 200.

```
Switch(config)# set igmp query-interval 200
```

Changing the Maximum Query Response Time

By default, the maximum query response time advertised in IGMP queries is 10 seconds. If the switch is using IGMP Version 2, you can change this value. To change the maximum query response time, use the following command in configuration mode:

Command	**Purpose**
set igmp query-resinterval <*0-200 seconds*>	Set the maximum query response time advertised in IGMP queries.

6.3 Access Lists

An access list is a criteria statement that the switch uses to determine whether to allow or block traffic based on MAC addresses, IP addresses, or UDP/TCP ports. Access lists can be configured to provide basic security on your network, and to prevent unnecessary traffic between network segments. Access lists are applied to inbound traffic only.

When configuring an access list, an argument of 'priority' must be specified. The priority of an ACL is important, as the switch tests addresses of each packet against the criteria in access lists one by one (in the order of the priority) until it finds a match. One of the arguments in specifying the access list is the **'mask'** that comes after a MAC address or IP address. This argument identifies which bits in the address field are to be matched. A "1" indicates that positions must match; a "0" indicates that position is ignored

The check of a match comes first for an access list with lower priority(lower value) than those with higher priority values. The **last** match determines whether the software accepts or rejects the address. In case of multiple matches, the match in IP mode takes precedence over that in MAC mode. Because the switch goes through the whole set of access lists to find matches, the priority of the ACL is critical.

Important! By default, if no conditions match, the switch allows the address.

The switch supports up to 256 access lists, and MAC address based access lists can not exceed 64.

An access list can be configured using the command and its arguments in configuration mode below:

```
access-list name acl1 ?
  add          Create a new access-list
  action       Specify the action of the ACL entry
  clear        Clear ACL entry contents
  delete       Remove the ACL entry
  enable       Enable the ACL entry
  disable      Disable the ACL entry
  set          Set ACL entry contents
```

6.3.1 Creating an Access List

To create an access list, use the command below:

Command	**Purpose**
access-list name acl1 add priority 1	Create an access list named 'acl_name' with priority 1

6.3.2 Configuring an Access List

To configure an access list, use the command below:

Command	Purpose
access-list name acl1 set ……	Set the criteria statement of an access list named ‘acl_name’
access-list name acl1 action ……	Specify the action to take if criteria of the access list is matched

In the following example, an access list will be created to block traffic sent from MAC address 00-00-94-12-34-56.

```
Switch(Config)# access-list name acl_mac add priority 1

Switch(Config)# access-list name acl_mac set mac-mode macsa 00-00-94-12-34-56 ff-ff-
ff-ff-ff-ff

Switch(Config)# access-list name acl_mac action deny

Switch(Config)#
```

In the next example, a standard access list will be created to deny all traffic from 192.168.123.254 , and allow all other traffic to be forwarded.

```
Switch(Config)# access-list name acl_ip add priority 1

Switch(Config)# access-list name acl_ip set ip-mode srcip 192.168.123.254
255.255.255.255

Switch(Config)# access-list name acl_ip action deny

Switch(Config)#
```

In the following example, an access list will be created to deny Telnet traffic.

```
Switch(Config)# access-list name acl_tcp_src add priority 1

Switch(Config)# access-list name acl_tcp_src set ip-mode l4port src-port from 23 to 23

Switch(Config)# access-list name acl_tcp_dst add priority 2

Switch(Config)# access-list name acl_tcp set ip-mode l4port dst-port from 23 to 23

Switch(Config)# access-list name acl_tcp_src action deny

Switch(Config)# access-list name acl_tcp_dst action deny

Switch(Config)#
```

6.3.3 Applying an Access List to an Interface

After creating your access lists, you can choose interfaces for which the access lists will be applied. If no interfaces are explicitly selected, the access list is applied to all interfaces.

To select the interface for an access list, use the following command:

Command	Purpose
access-list name acl1 set portlist ……	Select interfaces that the access list 'acl1' will be applied

In the next example, we will create an extended access list that will allow only SMTP bound traffic (port 25) to be forwarded on port 7, and deny all other traffic.

```
Switch(Config)# access-list name acl_tcp_dst_smtp add priority 1

Switch(Config)# access-list name acl_tcp_dst_smtp set ip-mode l4port dst-port from 25
to 25

Switch(Config)# access-list name acl_tcp_dst_smtp set portlist 7

Switch(Config)# access-list name acl_tcp_dst_smtp action permit

Switch(Config)# access-list name acl_deny_all add priority 2

Switch(Config)# access-list name acl_deny_all set ip-mode l4port dst-port from 25 to
25

Switch(Config)# access-list name acl_deny_all set mac-mode macsa 00-00-94-12-34-56 00-
00-00-00-00

Switch(Config)# access-list name acl_deny_all action deny
```

6.3.4 Enabling an Access List

To enable a configured access list, use the command below. All the examples above require execution of the 'enable' command to make the access lists effective.

Command	Purpose
access-list name acl_name enable	Enable an access list named 'acl_name' .

Chapter 7: VLAN Configuration

VLANs are used to organize any group of network nodes into separate broadcast domains. VLANs confine broadcast traffic to the originating group and eliminate broadcast storms in large networks. VLANs provide a secure and efficient network environment.

VLANs are based on untagged port groups, or traffic can be explicitly tagged to identify the VLAN group to which it belongs. Untagged VLANs can be used for small networks attached to a single switch. Tagged VLANs should be used for larger networks, and all the VLANs assigned to the inter-switch links.

Use the VLAN feature to partition a single IntraCore 3624/48 into a VLAN each containing its own set of ports. Packets are forwarded only between ports belonging to the same VLAN. This allows you to restrict access from one segment to another to increase network security or to reduce traffic. To set up VLANs you should specify the ports belonging to the VLAN, and setup of tagging. The following shows the commands available to configure VLAN's.

```
Switch(Config)# vlan ?
  add                 Create a new VLAN
  delete              Remove a existed VLAN
  port                Configure 802.1Q port parameters for VLANs
  lag                 Configure lag to a special VLAN
Switch(Config)# interface 4

Switch(Interface 4)# vlan ?

  participation       Join or leave a VLAN

  protected           Configure port protected property

  dropnq              Configure port drop no 8021q frame

  ingress             Configure port filter

  pvid                Configure port PVID
```

The switch is shipped with a default VLAN with VLAN ID (VID) 1. All switch ports are included in the default VID 1. **The default VID 1 cannot be deleted**.

Up to 256 Virtual LANs (VLANs) are supported on the IntraCore 3624/48. The default VLAN with VLAN ID (VID) 1. All switch ports are included in the default VID 1. **The default VID 1 cannot be deleted**.

7.1 Creating or Modifying a VLAN

To create a VLAN with id 2, enter the following commands beginning in enabled mode:

```
Switch#
Switch# configuration
Switch(Config)# vlan
  add                 Create a new VLAN
  delete              Remove a existed VLAN
  port                Configure 802.1Q port parameters for VLANs
  lag                 Configure lag to a special VLAN
Switch(Config)# vlan add
```

```
  number              Enter a VLAN ID
  range               Enter a range of VLAN ID
Switch(Config)# vlan add number
  <2..4094>           Enter a VLAN ID
Switch(Config)# vlan add number 2
Switch(Config)#
```

VLANS can be configured using the following commands:

vlan add number 2	Create vlan 2
vlan add range from 3 to 6	Create vlans 3,4,5,6
vlan delete 3	Delete vlan 3

7.2 VLAN Port Membership

Ports of VLANS can be configured by the commands below :

7.2.1 configuring vlan ports

Command	Purpose/Format
vlan port {all | ports}……	This command is used to configure ports in a specific vlan. This configuration is applied to all ports or some of the ports specified by subsequent arguments

Use the following commands, beginning in configuration mode, to assign an IEEE 802.1q trunk port:

To create 3 vlans,2,3,4 with vlan 2 untagged port members 1,2,3,4, vlan 3 untagged port members 6,7,8,9, and vlan 4 untagged port members 11,12,13,14, enter the following commands beginning in configuration mode. Note that exclude is used so ports belong to various vlans exclusively:

Note that exclude is used in 3rd command so ports 3,5,7,8,9 belong exclusively to vlan 3:

```
Switch(Config)# vlan add number 2

Switch(Config)# vlan port ports port-configure 2 untagged 1-4

Switch(Config)# vlan port ports port-configure 1 exclude 1-4

Switch(Config)# vlan add number 3

Switch(Config)# vlan port ports port-configure 3 untagged 6-9

Switch(Config)# vlan port ports port-configure 1 exclude 6-9
```

```
Switch(Config)# vlan add number 4

Switch(Config)# vlan port ports port-configure 2 untagged 11-14

Switch(Config)# vlan port ports port-configure 1 exclude 11-14

Switch(Config)#
```

7.2.2 Trunk (IEEE 802.1q)

By default, a trunk port is a member of all VLANs.

Use the following commands, beginning in configuration mode, to assign an IEEE 802.1q trunk port:

Command	**Purpose**
interface IFNUMBER	Enter the interface number to access the interface configuration mode.
Vlan participation	This command designates the interface to be a member of a vlan Use the **no** form of this command to reset to the default of static-access mode.

Continue with the example in previous section, the commands below are used to make port 20 an IEEE 802.1q trunk port:

```
Switch(Config)# interface 20

Switch(Interface 20)# vlan participation tagged 2

Switch(Interface 20)# vlan participation tagged 3

Switch(Interface 20)# vlan participation tagged 4
```

The trunk port accepts tagged and untagged frames. All the untagged frames are classified to the trunk port's native VLAN (the VLAN whose VID matches the port's PVID). The trunk port also sends out the frames as untagged for the native VLAN and tagged for other VLANs.

Chapter 8: Quality of Service Configuration

Quality of Service (QoS) is a general term referring to various methods of traffic management you can employ on your network to ensure that traffic you identify as high-priority can use a sufficient share of the available bandwidth. The IC39240/480 internally has 4 COS queues per port with which a wide varieties of applications (Video/Audio) can be supported.

In QOS, packets are classified by the priority assigned to them. Packets can be assigned a priority in various ways. A packet can be assigned a priority based on the input port, 802.1P header or ACL. There are 8 priorities 0~7. Each packet is queued on one of the 4 internal queues based on its priority and queuing configuration. Queue 4 has the highest priority and queue 1 the lowest.

The IC39240/480 supports the following QoS methods:

- Weighted Round Robin
- 802.1P Priority Queuing
- IP precedence, DSCP and DSCP Remark
- Ingress Rate-Limit and Egress Traffic-Shaping

8.1 Scheduling algorithm

There are 2 methods to schedule a packet to be transmitted from the switch : strict priority, and weighed round robin.

In strict priority, the packet with the highest priority will be sent first, the lower priority packets will be sent only when all higher priority packets have been sent. Therefore a low priority packet will not be sent if higher priority packets are present all the time.

In weighed round robin, the higher priority will not be able to hog all the XMT resources. The resources are allocated based on the weight value associated with each queue. The service of a queue will stop when the resource is used up. Then the service will go to the next queue. This will proceed with the 4 queues in a round robin fashion.

8.1.1 Configuring Weighted Round Robin

When Weighted Round Robin is enabled, the default settings are as follows:

Queue	Weight
1	1
2	2
3	4
4	8

One can change the weights assigned to each queue to alter the service priorities. Based on the default values, queue 4 will be allocated more resource, hence higher priority.

To set weighted round robin settings, use the following command in EXEC mode:

Command	Purpose
Switch<config>#qos scheduling [wrr | strict]	Set the scheduling method.
Switch<config>#qos wrr …..	Set the settings of the weighted round robin.

8.1.2 Monitoring Weighted Round Robin

To display information about weighted round robin settings, use the following command in EXEC mode:

Command	Purpose
show qos queue-settings	Displays the settings of the weighted round robin.

8.2 Priority Queuing

Priority Queuing (PQ) allows you to define how traffic is prioritized in the switch. There are 8 traffic priorities (0-7) and 4 internal queues. Each packet can be assigned a priority based on which port it comes in, 802.1P header, or IP precedence/DSCP in IP header if the packet is an IP packet. The OQS configurations determine how priority is assigned based on packet characteristics to cause the switch to place traffic into the four queues.

8.2.1 Priority Mapping

Each outgoing packets is assigned to one of the 4 internal queues. The assigned is based on the configuration of the mapping between priorities and queues. The default mapping is as follows:

Priorities	Queues
0	1
1	1
2	2
3	2
4	3
5	3
6	4
7	4.

The default setting implies that priority 0 is the lowest and 7 the highest.

To change priority-queue mapping, use the following command in EXEC mode:

Command	Purpose
Switch<config>#qos cos ……	Set the mapping between 802.1P priorities and 4 internal queues

8.2.2 Port Based QOS

To set Port Based QOS, use the following command in EXEC mode:

Command	Purpose
Switch<config>#qos port-based ….	Set the priority of the port

8.2.3 802.1P Based QOS

A packet with an 802.1P header has a priority value which will be assigned to the packet by the switch.

8.2.4 IP Based QOS

The priority of an IP packet can be assigned based on the IP Precedence or DSCP value.

To set IP Precedence QOS, use the following command in EXEC mode:

Command	Purpose
Switch<config>#qos qos-advanced ip-precedence	Enable IP precedence QOS
Switch<config>#qos ip-precedence …	Set mapping between IP precedence value and the internal queues.

To set DSCP QOS, use the following command in EXEC mode:

Command	Purpose
Switch<config>#qos qos-advanced dscp	Enable IP DSCP QOS
Switch<config>#qos dscp …	Set mapping between DSCP value and the 8 priorities.

8.3 Traffic Shaping

Traffic shaping allows you to control the traffic going out from an interface in order to match its flow to the speed of the remote target interface Thus, traffic adhering to a particular profile can be shaped to meet downstream requirements, thereby eliminating bottlenecks in topologies with data-rate mismatches.

8.3.1 Configuring Traffic Shaping for an Interface

To configure traffic shaping for outbound traffic on an interface, use the following command in interface configuration mode:

Command	**Purpose**
Switch<config>#interface 5	Go to interface 5
Switch<interface 5>#rate-limit egress ….	Set the rate limit of interface 5

8.4 Rate Limiting

The rate-limit command allows you to control the amount of traffic coming in on a port.

To set rate limit on an interface 5 , use the following command in EXEC mode:

Command	**Purpose**
Switch<config>#interface 5	Go to interface 5
Switch<interface 5>#rate-limit ingress ….	Set the rate limit of interface 5

Chapter 9: Configuring the Switch Using the GUI

This chapter provides and overview of configuring the switch with the graphical user interface (GUI). For more information about the different features and how to implement them refer to the chapters specific to that function.

At your web browser enter the IP address for the switch to launch the GUI. Depending on settings, you may receive a certificate error message. Ignore this and continue.

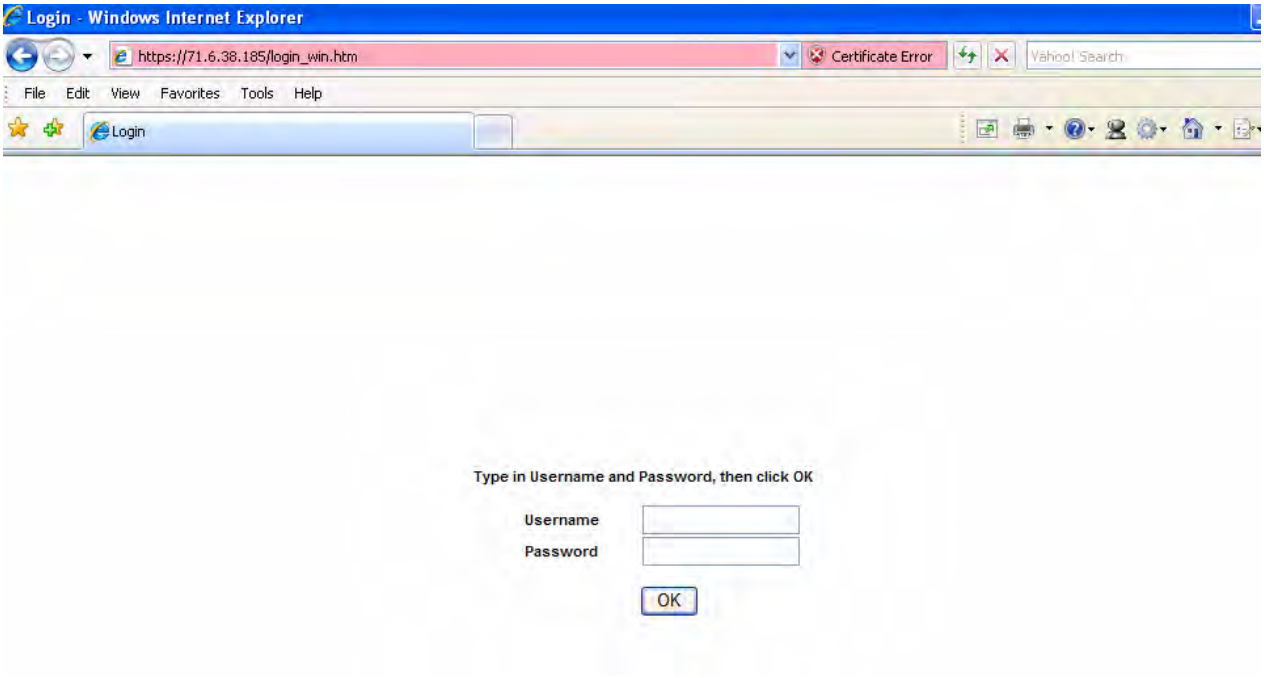
The defaults are:

IP Address: 192.168.0.1

Username: admin

Password: Asante (capital A)

Enter the username and password then click the “OK” button.

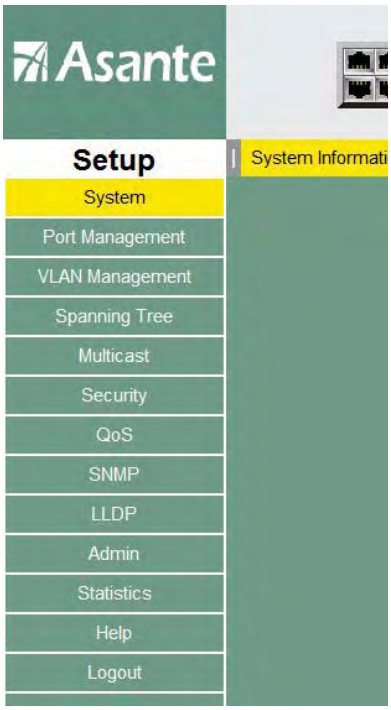


9.1 Main Configuration Menu

Use the navigation panel on the left side of the GUI screen to configure the switch. From this panel you can access the following screens:

- System
- Port Management
- VLAN Management
- Spanning Tree
- Multicast
- Security
- QoS
- SNMP
- LLDP
- Admin
- Statistics
- Help
- Logout

The following example shows the main Configuration Menu.

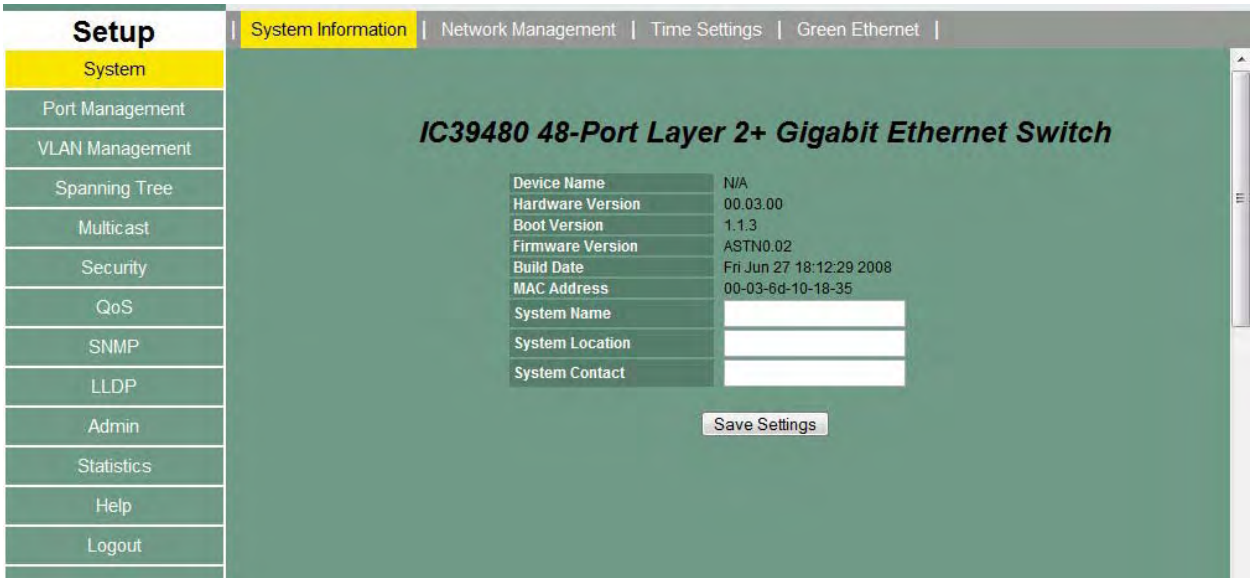


9.2 System

Use this section to access general information about the switch.

9.2.1 System System Information

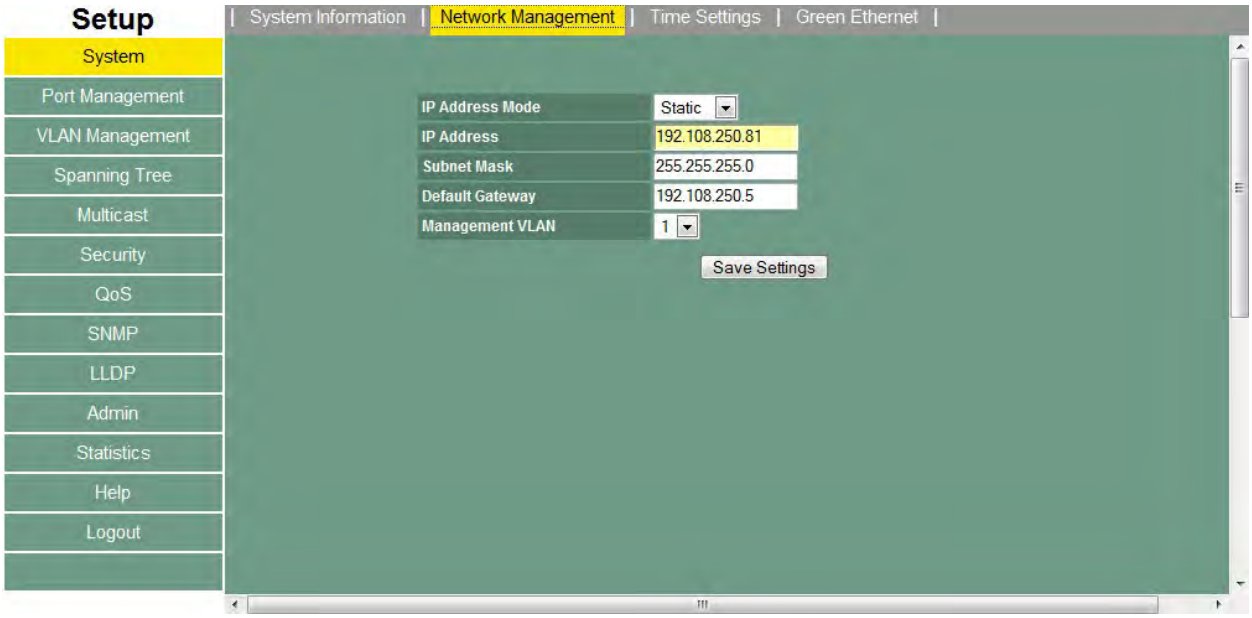
With the first system screen up a name and location for the switch can be added. A system contact can also be entered. You can also view the Hardware Version, Boot Version, Firmware Version, Build Date and the MAC Address. Save the settings when done by clicking the “Save Settings” button.



9.2.2 System Network management.

This page allows the setting of static IP information. The switch can also be set to receive an address automatically from a DHCP server. The switch ships with the default IP address **192.168.0.1**.

Click the “Save Settings” button when done.



The Internet Protocol (IP) is a packet-based protocol used to exchange data over computer networks. All other IP protocols are built on the foundation. IP is a network-layer protocol that contains addressing and control information that allows data packets to be routed.

This section describes how to configure the Internet Protocol (IP). A number of tasks are associated with configuring IP. A basic and required task for configuring IP is to assign IP addresses to network interfaces. Doing so enables the interfaces and allows communication with hosts on those interfaces using IP. Associated with this task are decisions about subnetting and masking the IP addresses.

An IP address is a location to and from which IP datagrams can be sent. IP addresses were traditionally divided into three classes. The Class A Internet address format allocated the highest eight bits to the network field and set the highest-order bit to 0 (zero). The remaining 24 bits formed the host field. The Class B Internet address allocated the highest 16 bits to the network field and set the two highest-order bits to 1, 0. The remaining 16 bits formed the host field. The Class C Internet address allocated the highest 24 bits to the network field and set the three highest-order bits to 1,1,0. The remaining eight bits formed the host field.

The table below lists the traditional classes and ranges of IP addresses and their status.

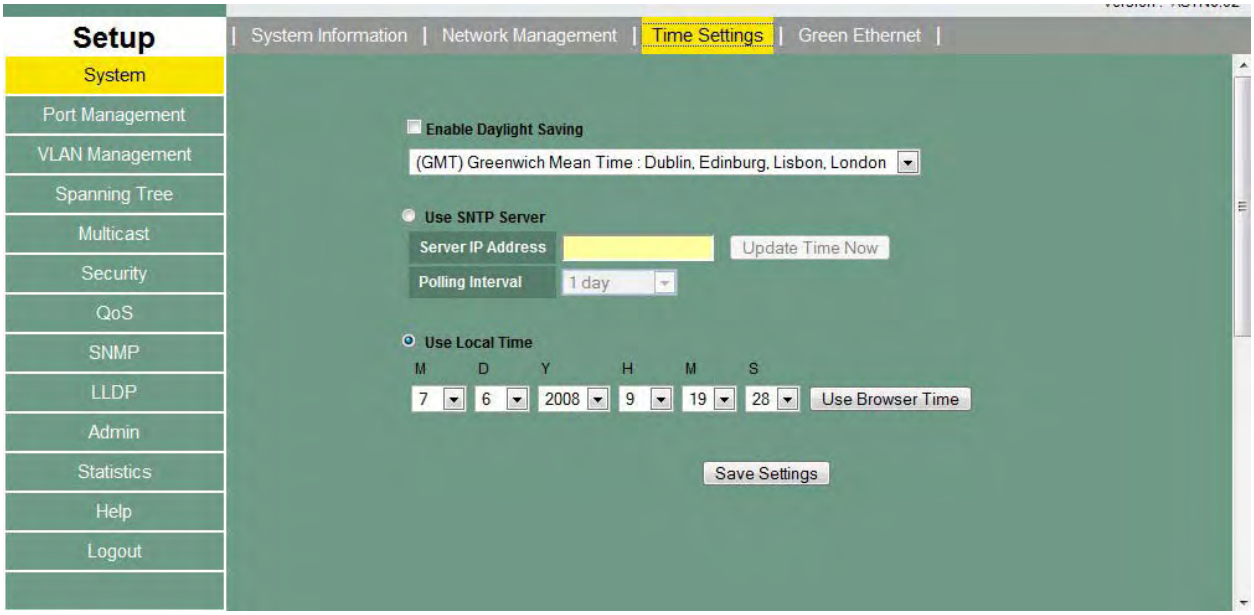
Class	Address or Range	Status
A	0.0.0.0 1.0.0.0 to 126.0.0.0 127.0.0.0	Reserved Available Reserved
B	128.0.0.0 to 191.0.0.0 255.255.255.0	Available
C	192.0.0.0 to 223.255.255.0	Available
D	224.0.0.0 to 239.255.255.255	Multicast group addresses
E	240.0.0.0 to 255.255.255.254 255.255.255.255	Reserved Broadcast

When multiple networks are connected to the Internet the traditional classified addressing scheme could cause you to run out of IP addresses.

The usual way of assigning IP addresses uses the prefixes of 8, 16, or 24 bits. Using prefixes of 13 to 27 bits an address includes the standard 32-bit IP address and adds information on how many bits are used for the network prefix. In the IP address 206.203.1.35/27, the “/27” indicates that the first 27 bits are used to identify the unique network, and the remaining bits are used to identify the specific host.

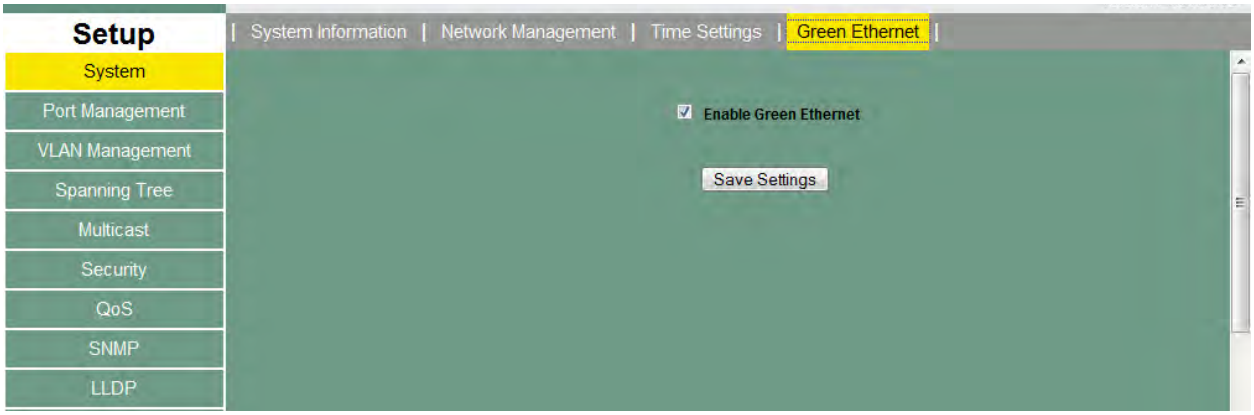
9.2.3 System Time Setting

Use the Time Setting page to set the time zone or local time for the switch. Daylight savings can also be enabled. Click the “Save Settings” button when done.



9.2.4 System – Green Ethernet.

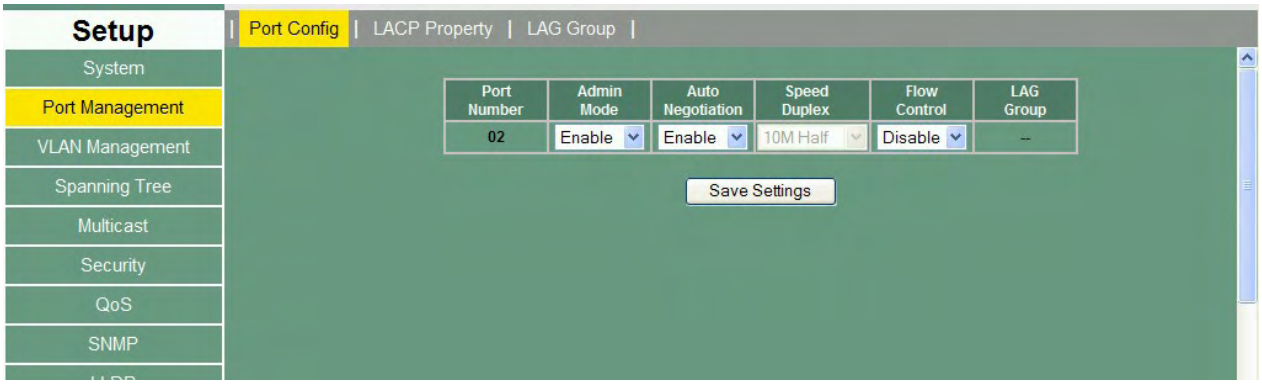
Green Ethernet is a power saving technology that allows the switch to save power when Ethernet is not being actively used.



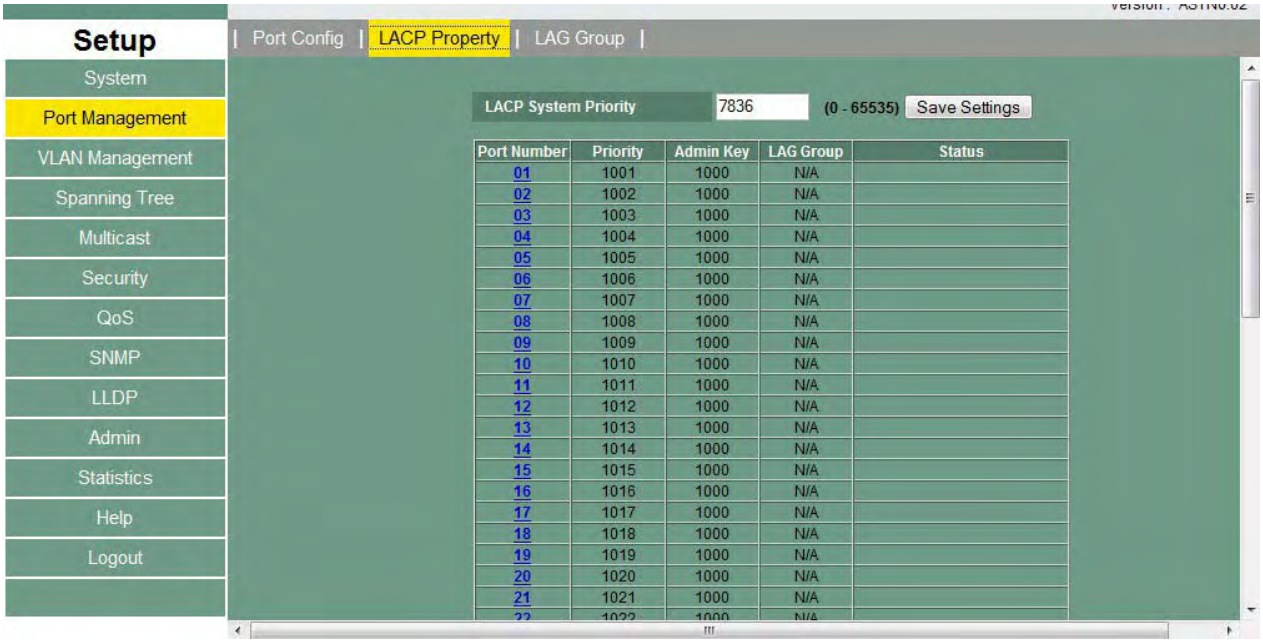
9.3 Port Management – Port Config

The Port Management section displays assorted settings for each port.

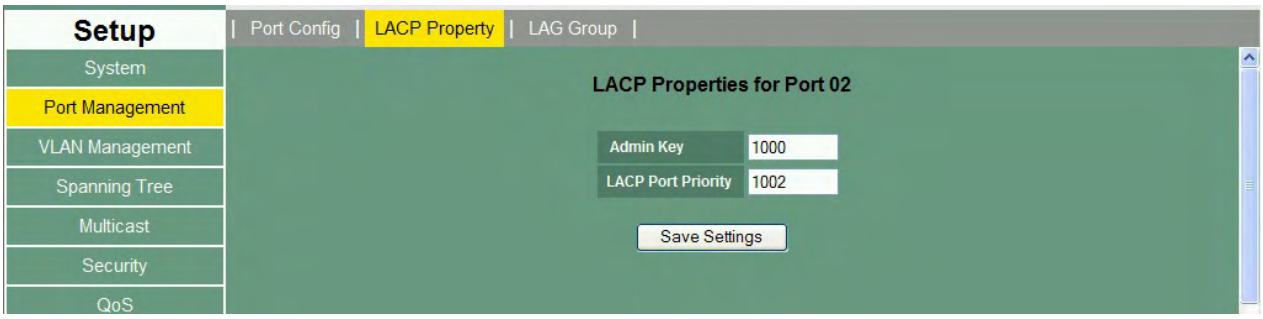
Port Management – Port Config - Specific Port. Settings can be made on a per port basis. When a port number is clicked the subscreen appears.



Port management – LACP Property. The LACP properties are displayed on this screen. The system LACP Priority can be set here. By clicking on a port number, a subscreen for each port is available.

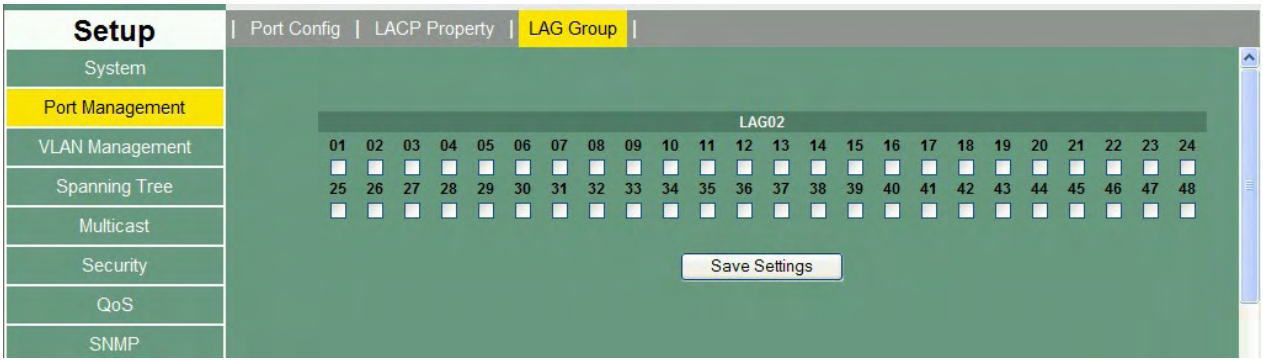


Port Management – LACP Property – Port. Settings for each port can be entered.



Port Management – LAG Group. Click on a group number to set the groups properties.

Port Management – LAG Group - Each Group. Once a link aggregation group is specified, the screen below can be used to add ports to the group.


Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
Port Config | LACP Property | LAG Group
LAG02
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
Save Settings

9.4 VLAN Management.

VLANs are used to organize any group of network nodes into separate broadcast domains. VLANs confine broadcast traffic to the originating group and eliminate broadcast storms in large networks. VLANs provide a secure and efficient network environment.

VLANs are based on untagged port groups, or traffic can be explicitly tagged to identify the VLAN group to which it belongs. Untagged VLANs can be used for small networks attached to a single switch. Tagged VLANs should be used for larger networks, and all the VLANs assigned to the inter-switch links.

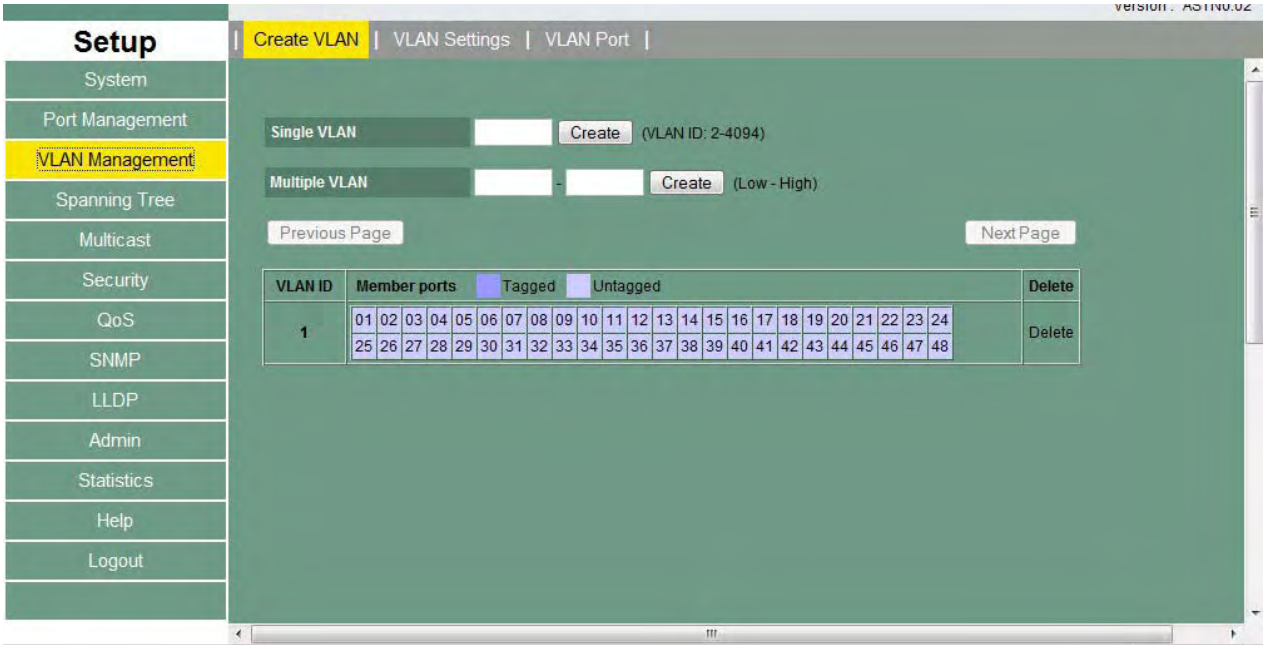
A VLAN is a group of end stations with a common set of requirements, independent of physical location. VLANs have the same attributes as a physical LAN but allow you to group end stations even if they are not located physically on the same LAN segment.

VLANs are usually associated with IP subnetworks. For example, all the end stations in a particular IP subnet belong to the same VLAN. Traffic between VLANs is assigned. LAN port VLAN membership is assigned manually on an port-by-port basis. VLANs can be defined as either Layer 2 or Layer 3 and a VLAN cannot switch between the two layers. Before you create a VLAN, you must decide how they will be created and a naming convention to ensure duplicate VLAN names are not used.

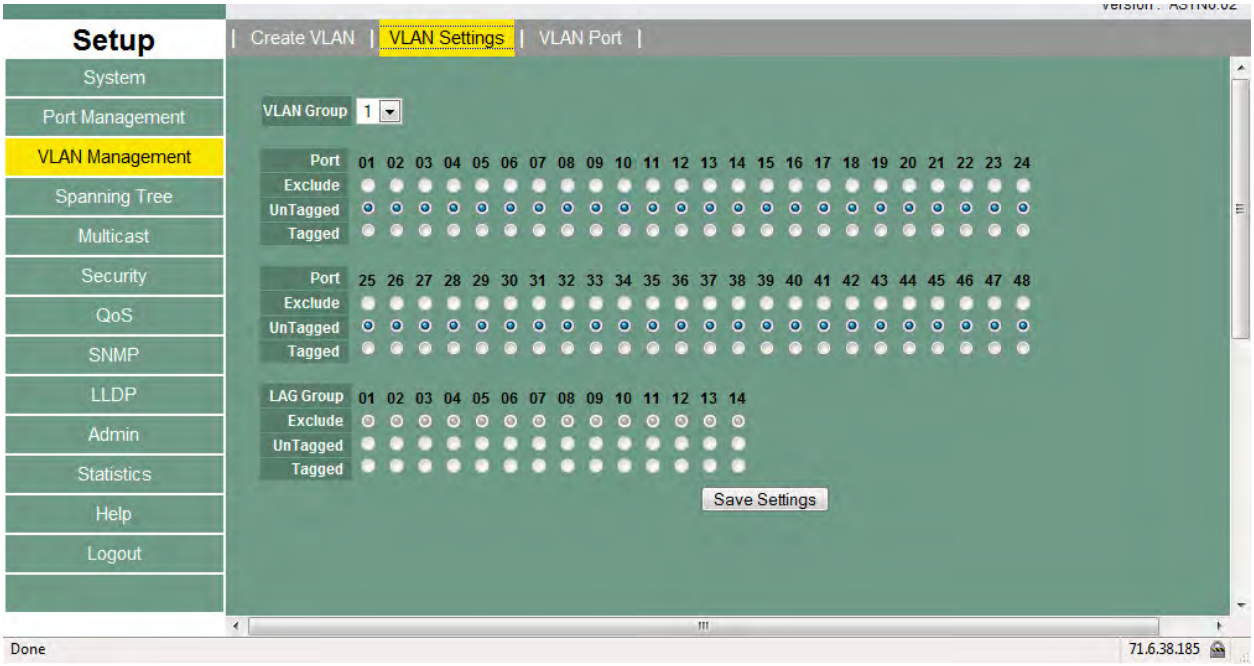
Up to 4094 Virtual LANs (VLANs) are supported on the IntraCore IC3624/48. The default VLAN with VLAN ID (VID) 1. All switchports (eth1–eth24) are included in the default VID 1. **The default VID 1 cannot be deleted**.

Use this screen to view VLAN information and create a VLAN group. At the top of the main VLAN screen you can toggle between VLAN group information and VLAN port information by click on each link.

VLANs can be created one at a time, or a range of VLANS can be created all at once.

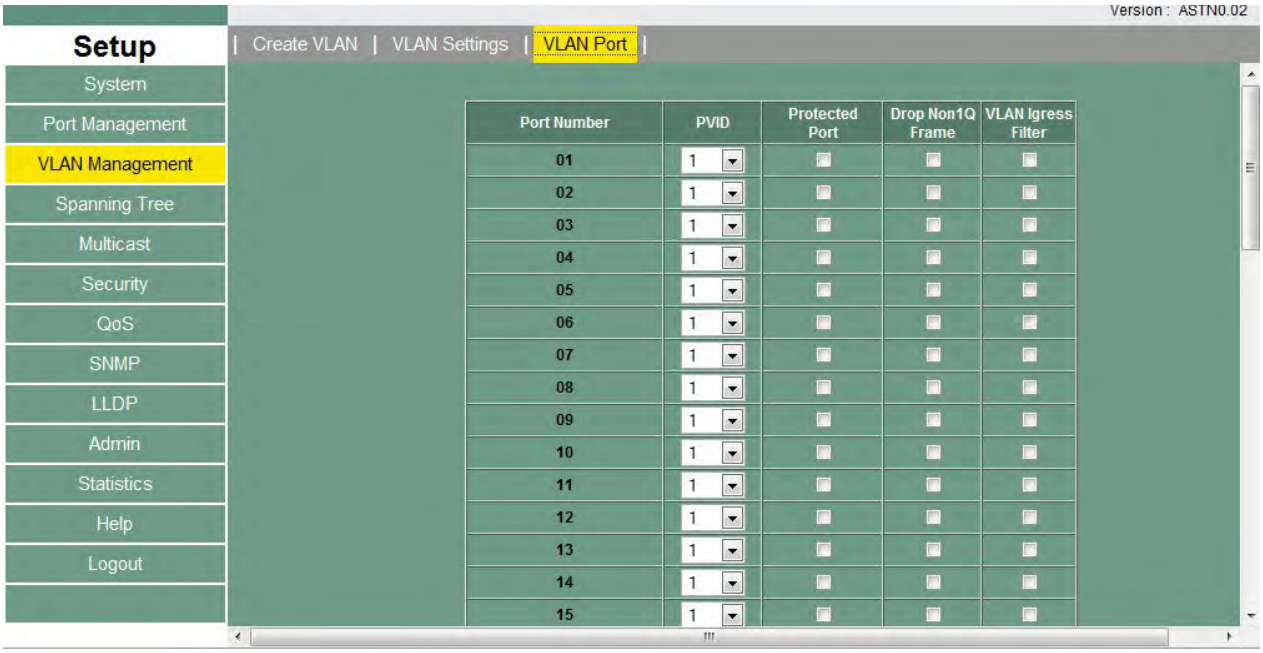


VLAN MANAGEMENT – VLAN SETTINGS. With a vlan selected, ports can be marked as tagged, or untagged. Lover on the screen, LAG groups can also be tagged or untagged. Click Save Settings when done.



VLAN MANAGEMENT – VLAN PORT. This screen allows additional settings to be controlled on a per port basis. Here the PVID can be changed to. Changing the PVID in required to force the port to respond to a particular VLAN. Becoming a member of a VLAN is only the start. The port PVID must be changed to cause it to respond only to the desired VLAN.

Various filters can be set on this screen. Ingress filter, Non 802.1Q filter, and port protection can all be set here.



9.5 Spanning Tree.

RSTP (Rapid spanning tree protocol) can be enabled at this screen. Various timer settings can also be set. Use this screen to change the priority and the path cost for specific ports. The priority default value is 128, and the value range is 0–240 (in multiples of 16).

The lower the assigned port path cost is, the more likely that port will be accessed. The default port path cost for a 10 Mbps or 100 Mbps port is the result of the equation:

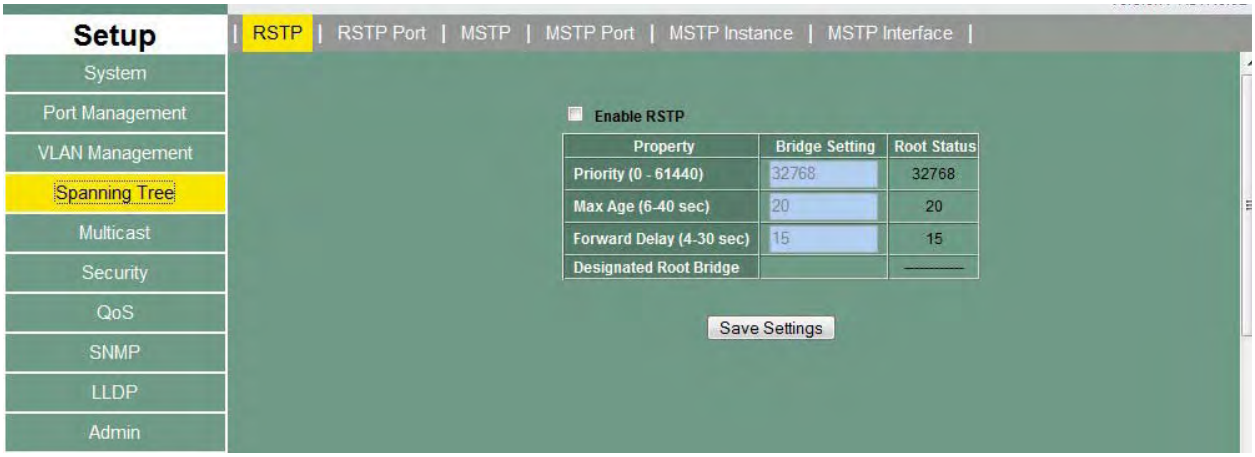
Path cost = 1000/LAN speed (in Mbps)

Therefore, for 10 Mbps ports, the default port path cost is 100. For 100 Mbps ports, it is 10. To allow for faster networks, the port path cost for a 1000 Mbps port is set by the standard at 4.

The default values for path cost is determined by the operating port speed:

- For ports operating in 1000Mb speed, the path cost is 20000
- For ports operating in 100Mb speed, the path cost is 200000

For ports operating in 10Mb speed, the path cost is 2000000



RSTP can be designated on a port by port basis.

Use this screen to change the priority and the path cost for specific ports. The priority default value is 128, and the value range is 0–240 (in multiples of 16).

The lower the assigned port path cost is, the more likely that port will be accessed. The default port path cost for a 10 Mbps or 100 Mbps port is the result of the equation:

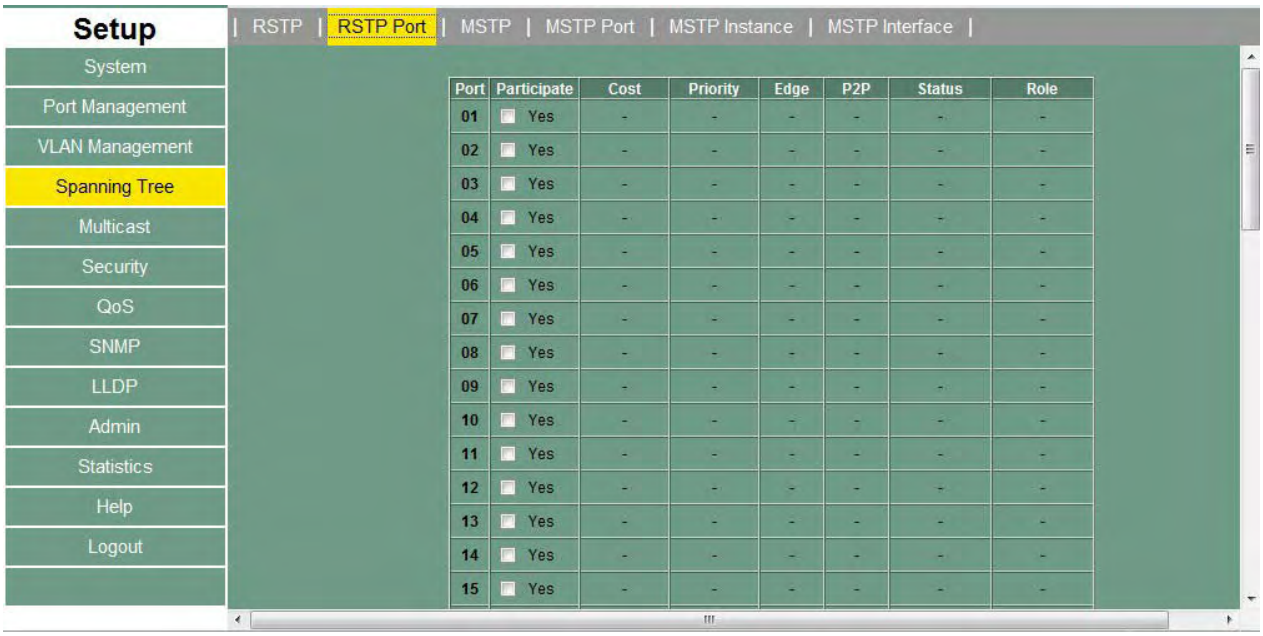
Path cost = 1000/LAN speed (in Mbps)

Therefore, for 10 Mbps ports, the default port path cost is 100. For 100 Mbps ports, it is 10. To allow for faster networks, the port path cost for a 1000 Mbps port is set by the standard at 4.

The default values for path cost is determined by the operating port speed:

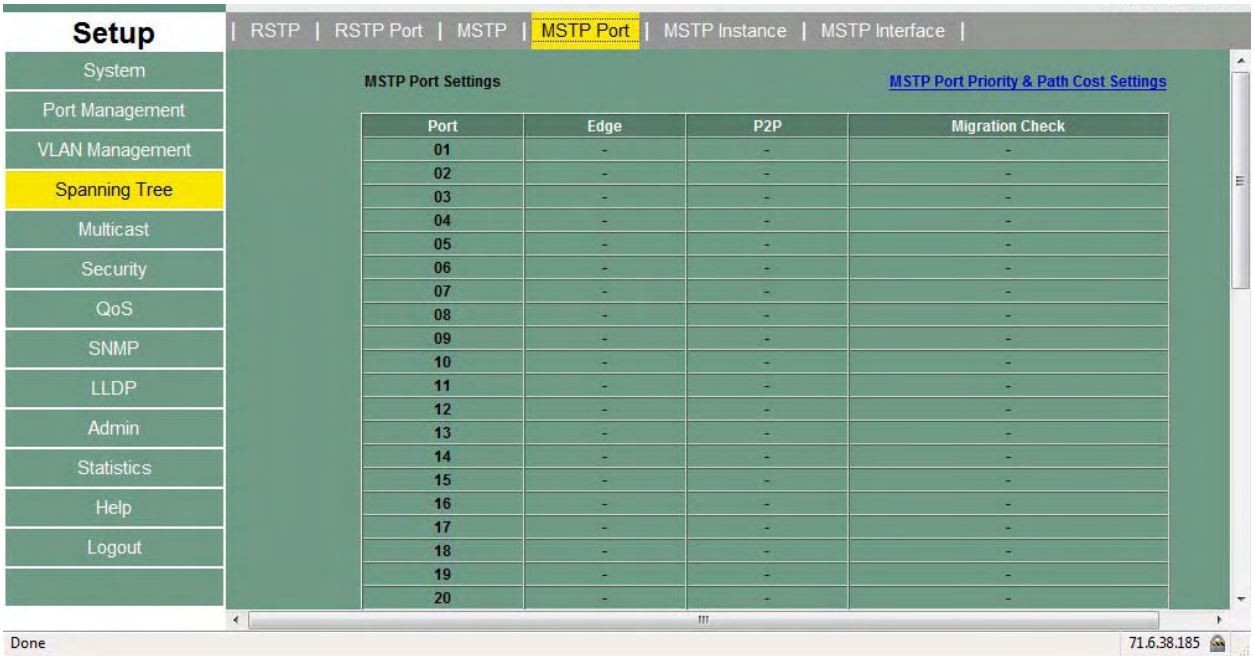
- For ports operating in 1000Mb speed, the path cost is 20000
- For ports operating in 100Mb speed, the path cost is 200000

For ports operating in 10Mb speed, the path cost is 2000000

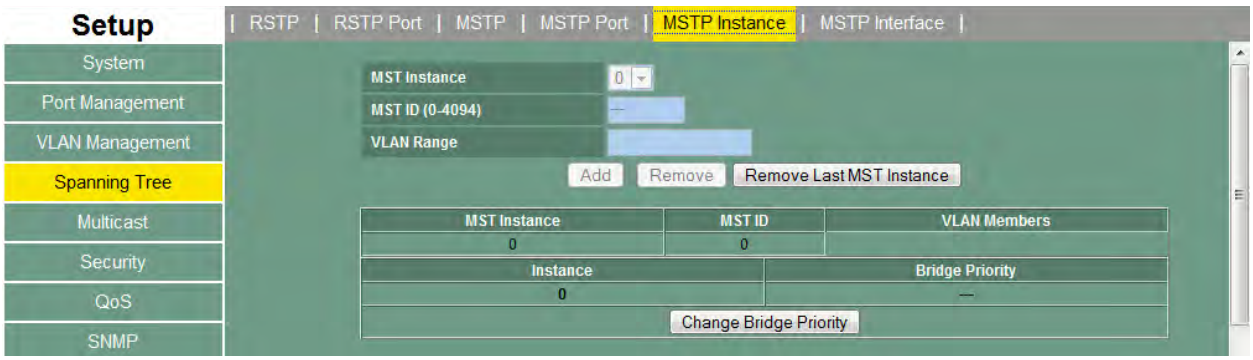

Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
RSTP | RSTP Port | MSTP | MSTP Port | MSTP Instance | MSTP Interface |
Port Participate Cost Priority Edge P2P Status Role
01 Yes - - - - - -
02 Yes - - - - - -
03 Yes - - - - - -
04 Yes - - - - - -
05 Yes - - - - - -
06 Yes - - - - - -
07 Yes - - - - - -
08 Yes - - - - - -
09 Yes - - - - - -
10 Yes - - - - - -
11 Yes - - - - - -
12 Yes - - - - - -
13 Yes - - - - - -
14 Yes - - - - - -
15 Yes - - - - - -

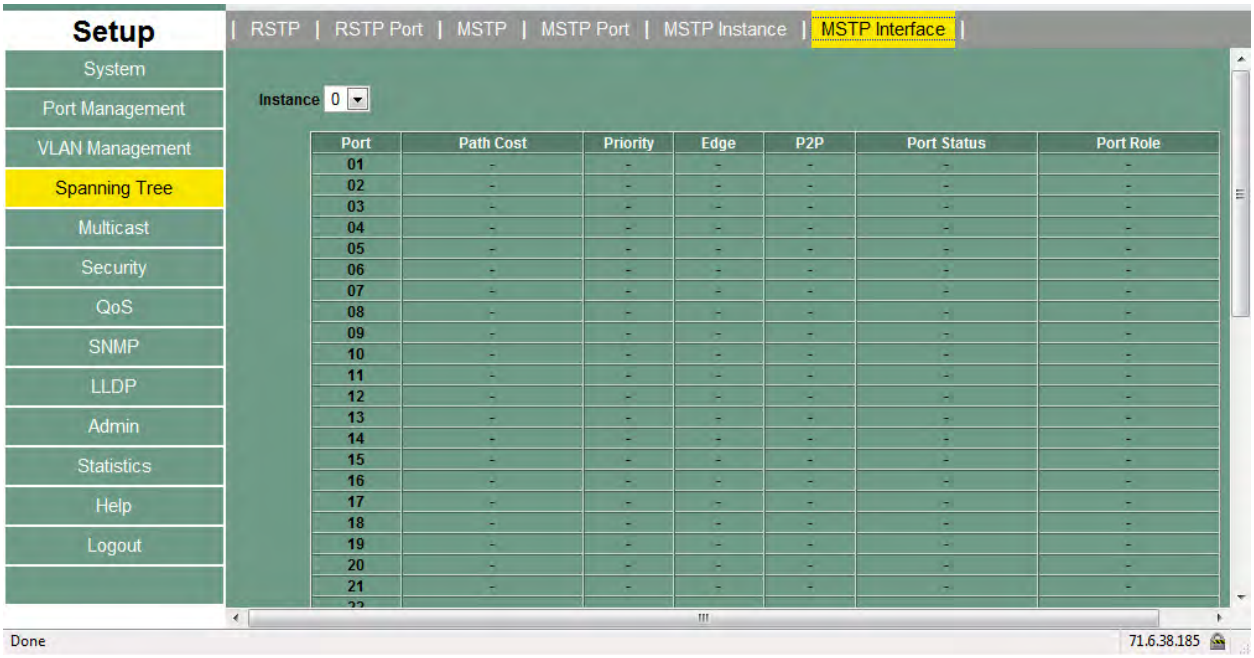
MSTP. Multiple Spanning Tree Protocol can be enabled on this page.

Individual Port properties can be manipulated at this screen.



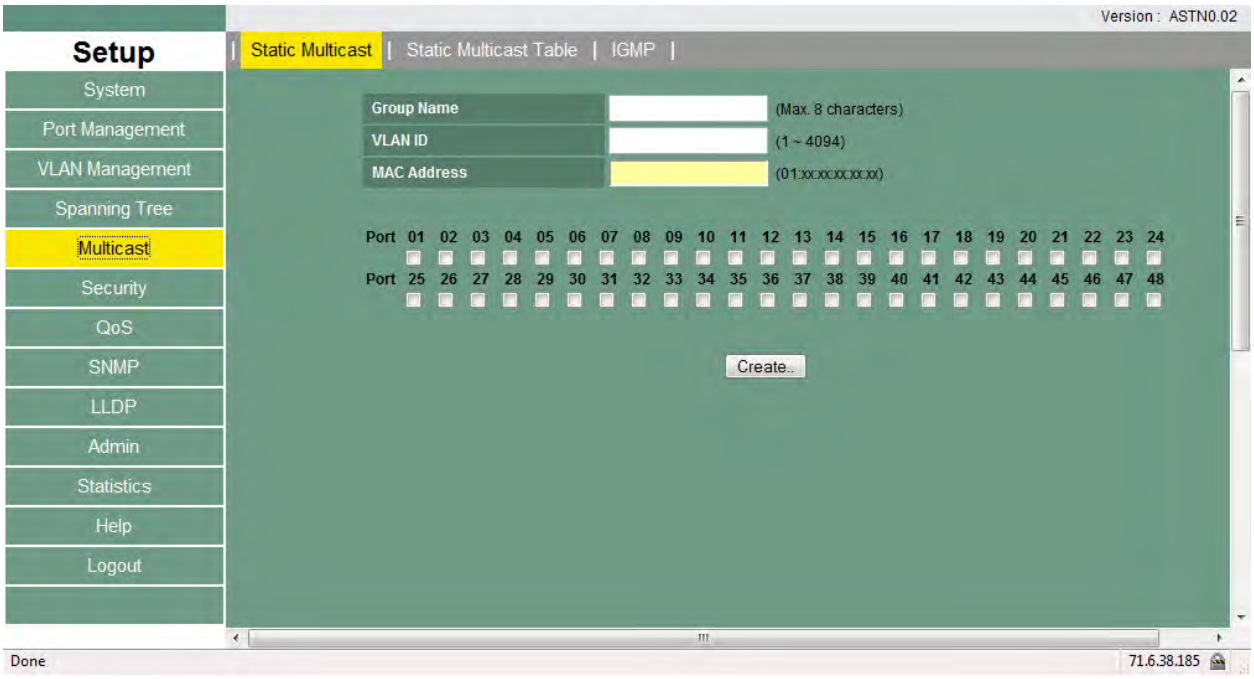
MST Instance parameters can be modified on the following two screens.





9.6 Multicast.

Static multicast settings can be set. Port by port participation can be controlled.

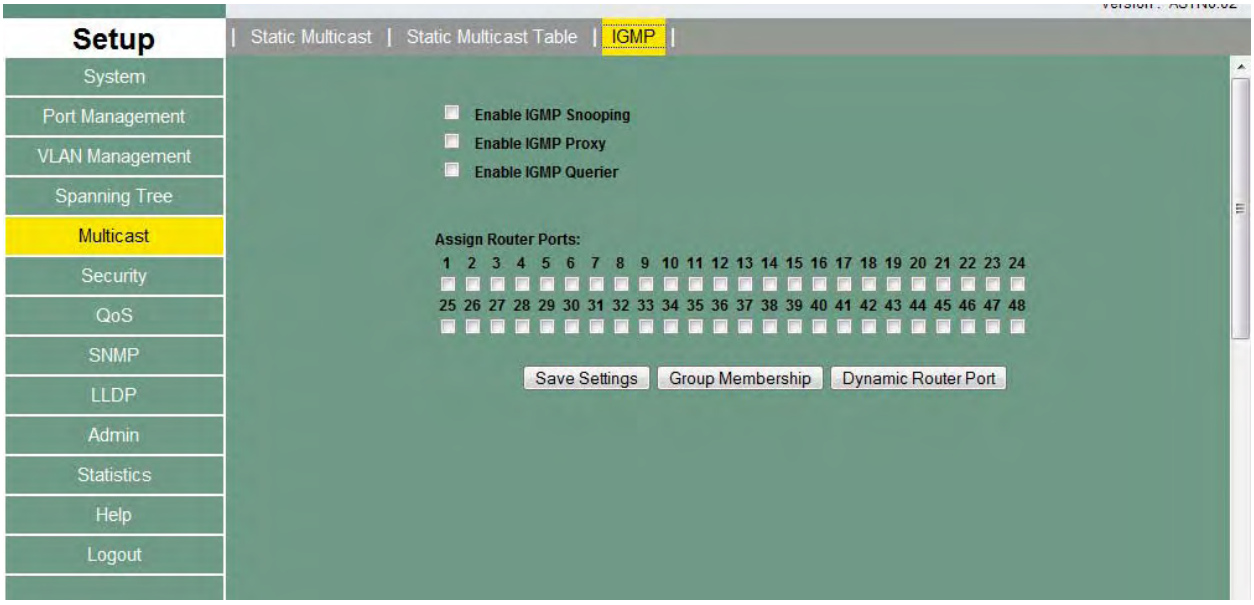


IGMP The Internet Group Management Protocol (IGMP) manages the multicast groups on a LAN. IP hosts use IGMP to report their group membership to directly connected multicast switches. Switches executing a multicast routing protocol maintain forwarding tables to forward multicast datagrams. Switches use the IGMP to learn whether members of a group are present on their directly attached sub-nets. Hosts join multicast groups by sending IGMP report messages.

IGMP uses group addresses, which are Class D IP addresses. The high-order four bits of a Class D address are 1110. Therefore, host group addresses can be in the range 224.0.0.0 to 239.255.255.255.

The address 224.0.0.0 will not be assigned to any group. The address 224.0.0.1 is assigned to all systems on a sub-net. The address 224.0.0.2 is assigned to all switches on a sub-net.

Multicast switches elect a designated switch for the LAN (subnet). The designated switch is the one with the highest IP address. The switch is responsible for sending IGMP host-query messages to all hosts on the LAN. By default, the designated switch sends IGMP host-query messages every 60 seconds in order to keep the IGMP overhead on hosts and networks very low. IGMP snooping allows multicasts to be pruned to only the ports whose users have requested the multicast. IGMP Querier should be enabled on one device on you local network. That querier actively determines which ports of which devices request multicast service.

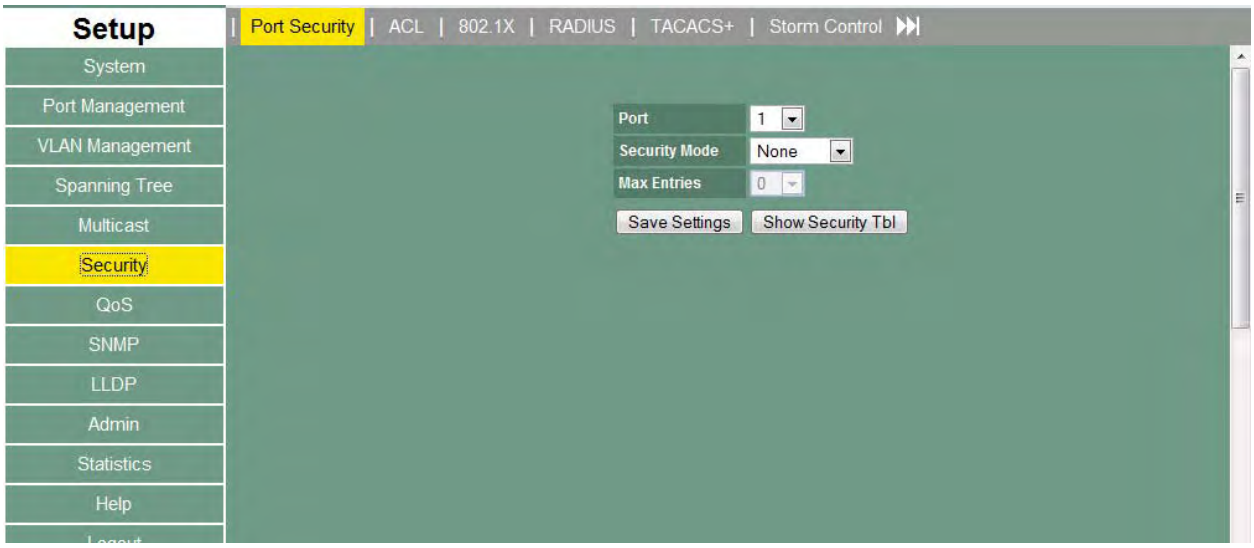


Multicast switches send IGMP host-query messages to discover which multicast groups are present on attached networks. These messages are sent to the all-systems group address of 224.0.0.1 with a time-to-live (TTL) value of 1.

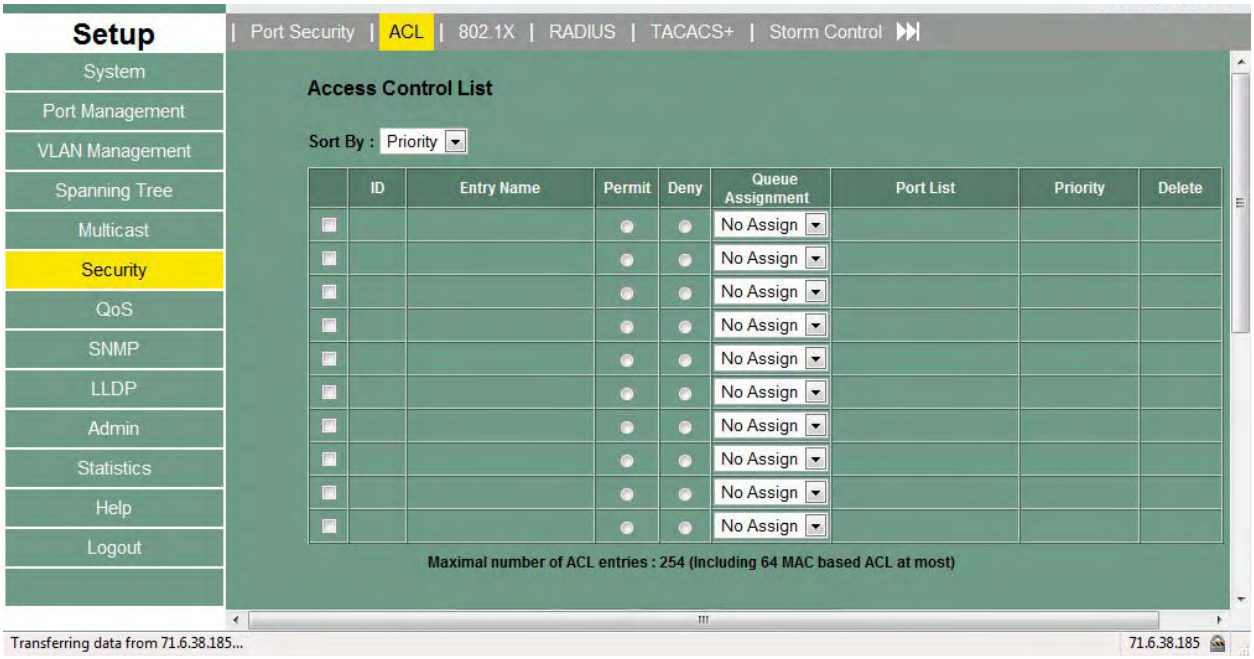
Multicast switches continue to periodically send host-query messages to refresh their knowledge of memberships present on their networks. If, after some number of queries, the switch software discovers that no local hosts are members of a multicast group, the software stops forwarding onto the local network multicast packets from remote origins for that group and sends a prune message upstream toward the source.

9.7 Security - Port Security.

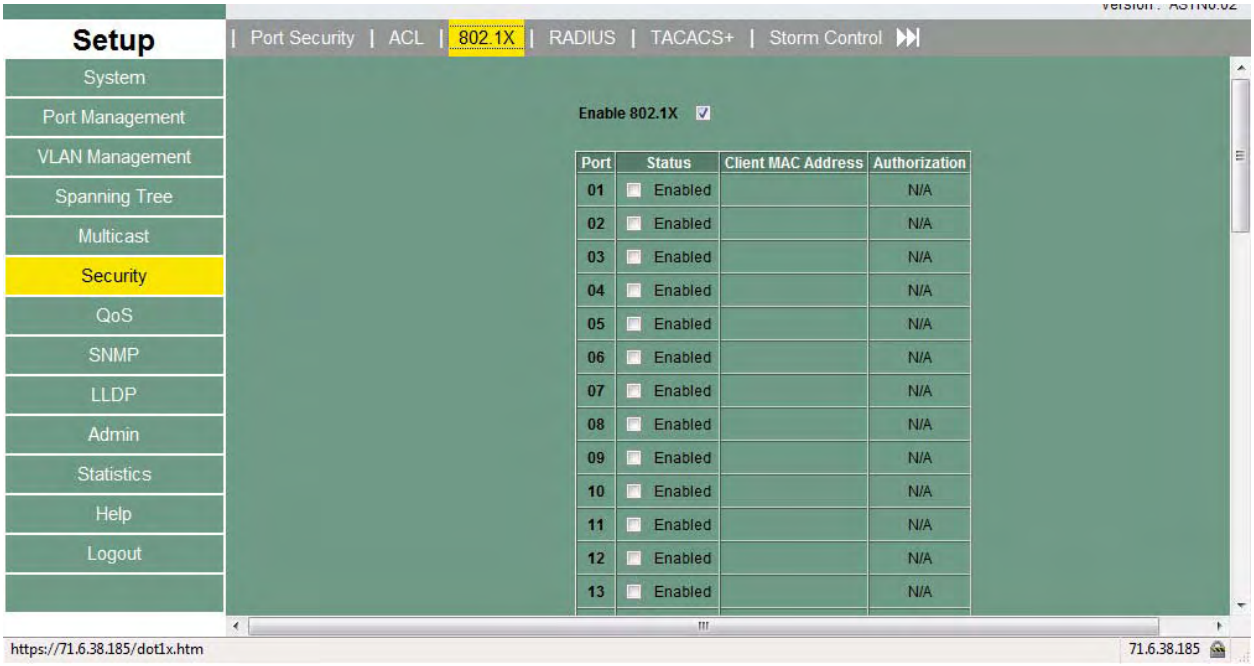
Each port can be listed individually or a table can be displayed using the Show Table button



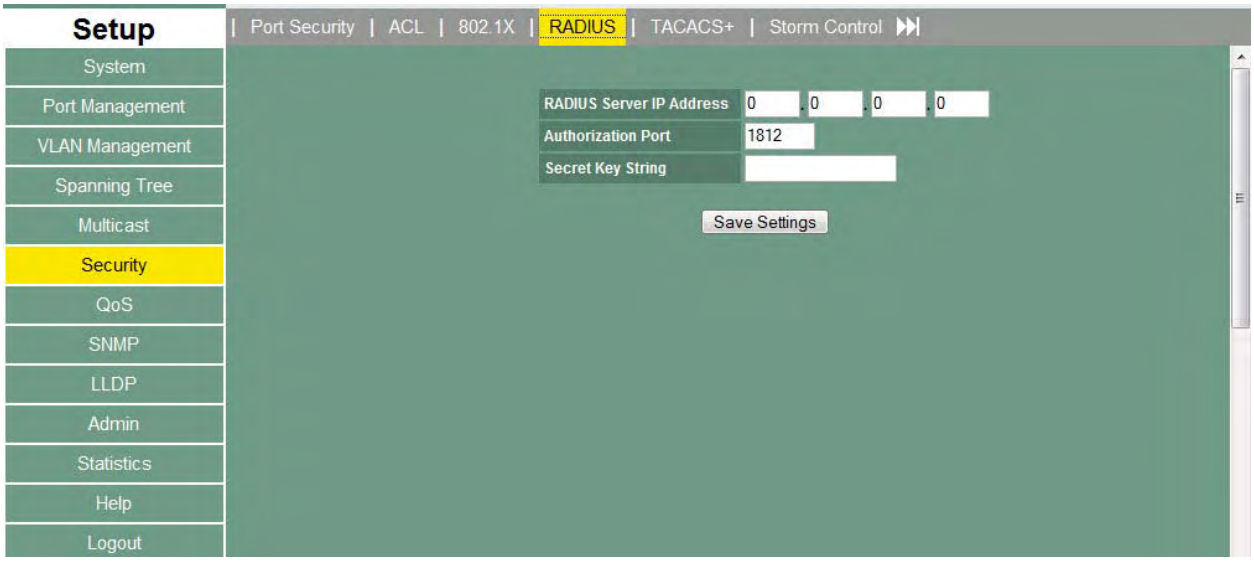
Access control lists can be established using this screen.



802.1X can be enabled on a per port basis

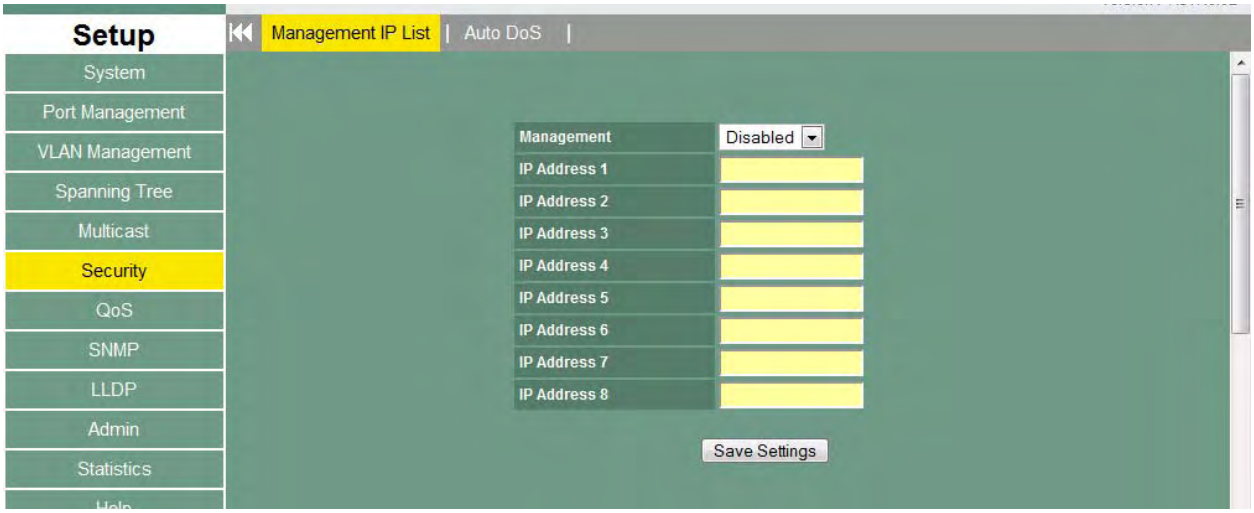


Radius server can be identified at this screen. A secret key can be created and the port can be altered.

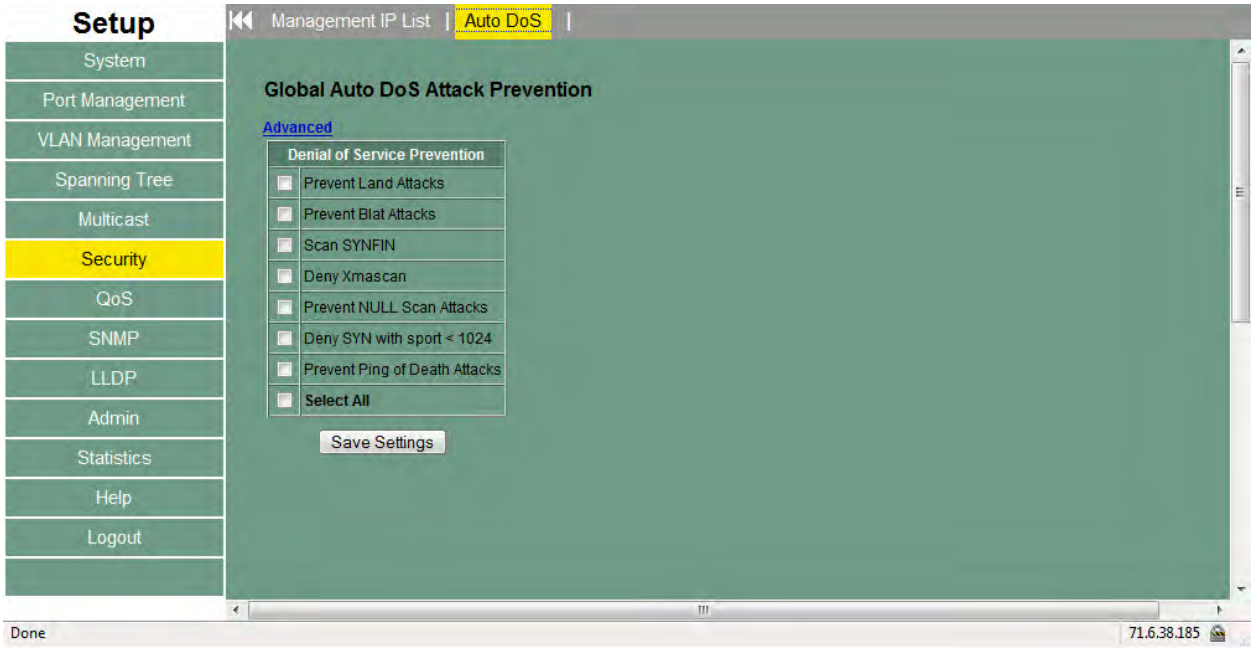


TACAS+ and **Storm Control** are available on the next screens.

Management IP list can be used to enter a list of IP addresses to limit the availability of switch Management.

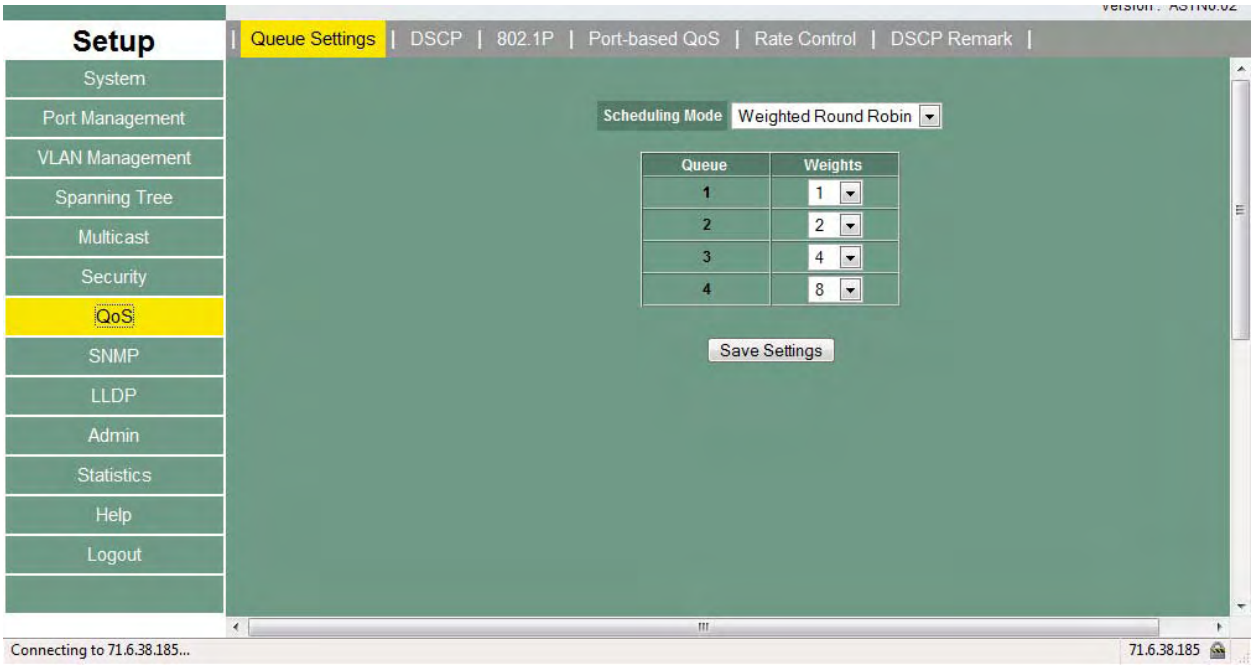


Auto DoS provides protection from a variety of denial of service type of threats.

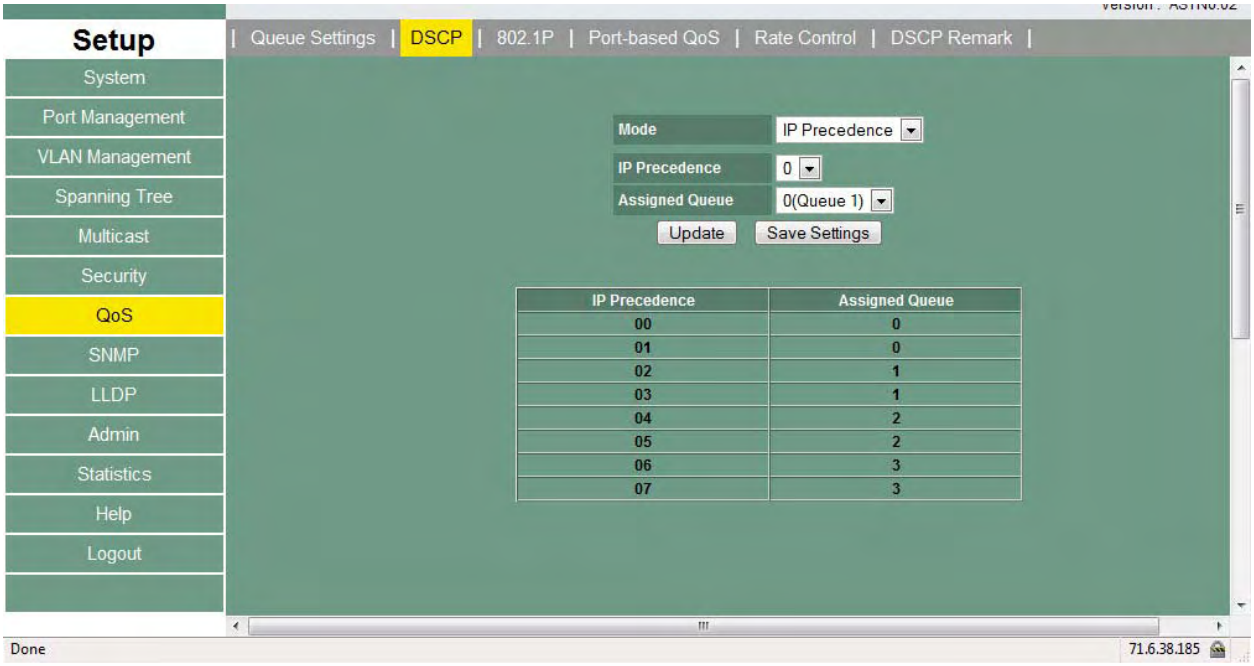


9.8 QoS.

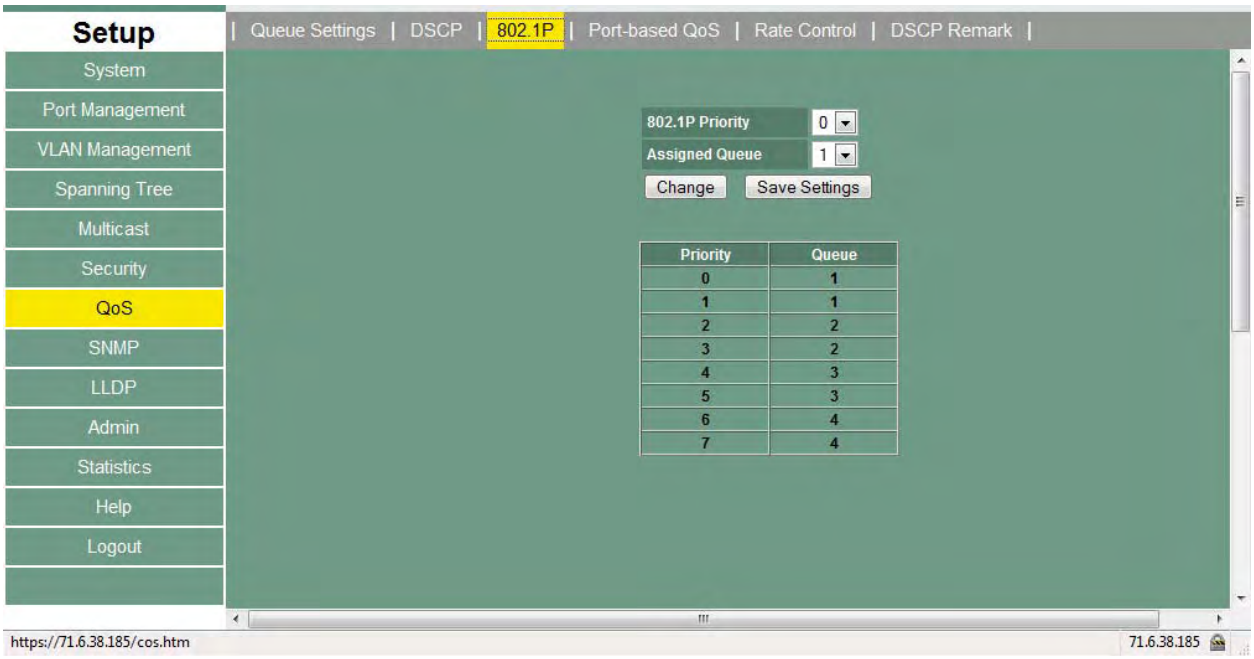
Quality of service settings allow various protocols to be selected to protect functions that require real time performance and limit other traffic.



DSCP can be implemented on this page. There are eight queues available numbering 0 – 7. Click on the Mode selector to choose DSCP. Then settings will be available to assign DHCP codes to the eignt queues.

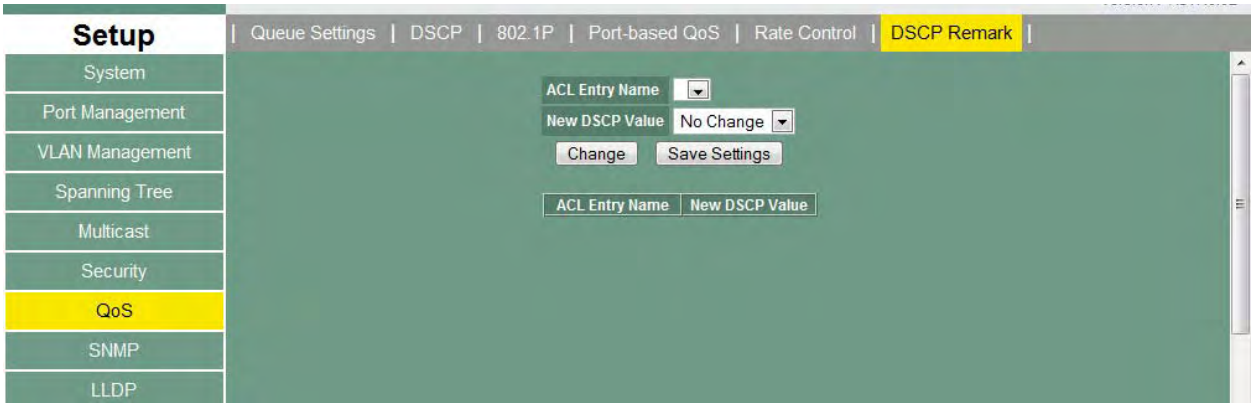


802.1P priory is supported to four queues. Each priority level can be assigned to one of the four queues.



Port-based QoS allows the priority for each port to be manually set. Click the Update button when done to save changes.

Rate Control allows traffic shaping for each port. An ingress rate limit can also be set.

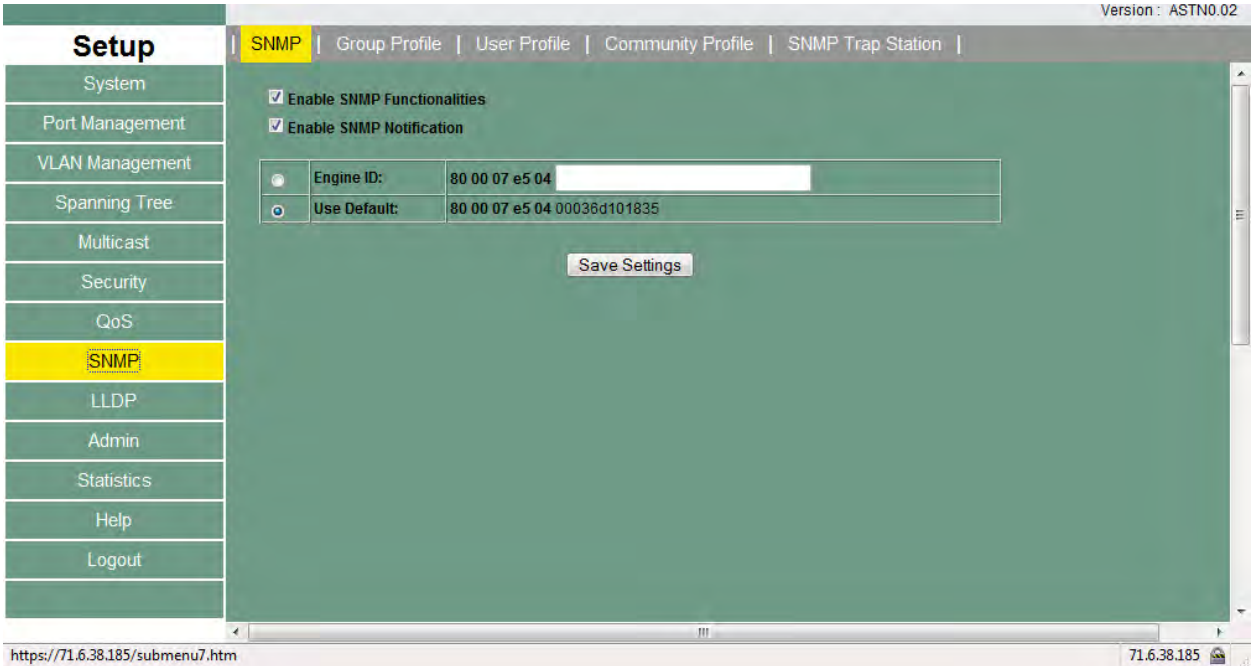


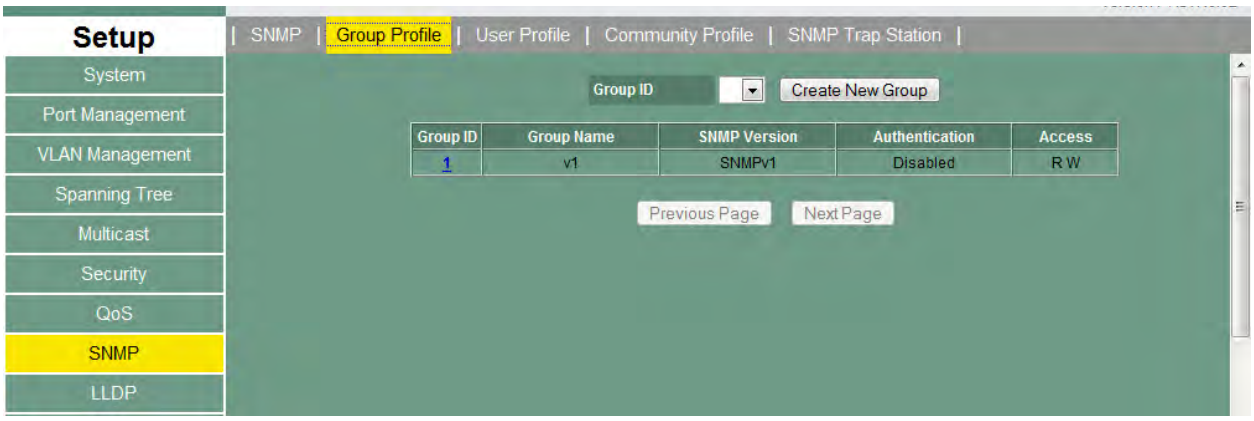
9.9 SNMP

Various screens are available to enable and manipulate SNMP. Profiles can be set for users, communities, and groups. SNMP allows network managers to obtain specific performance and configuration information from a software agent on a remote-network device. SNMP allows different types of networks to communicate by exchanging network information through messages known as protocol data units (PDUs). The IntraCore IC3624/48 supports SNMPv1, v2 and v3. The SNMPv3 protocol has improved the authentication, access control, and security methods

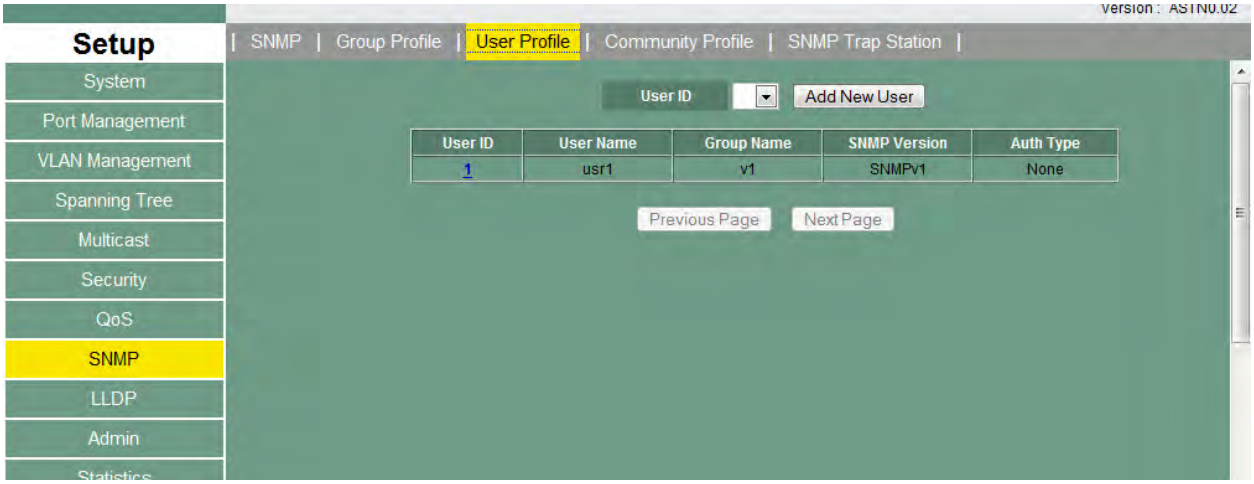
Use the following screens to set the read/write access and to enable or disable the trap authentication for this switch. The default SNMP read community access is public; the default SNMP write community access is private; the default trap authentication is disable.

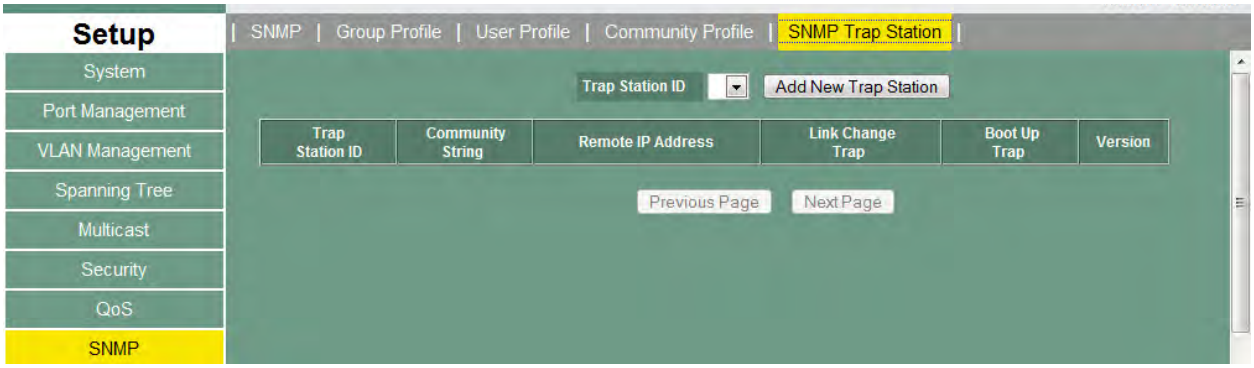
You can also set SNMP Traps for specific IP addresses allowing them to have access to communities that is different then the default set for the switch.



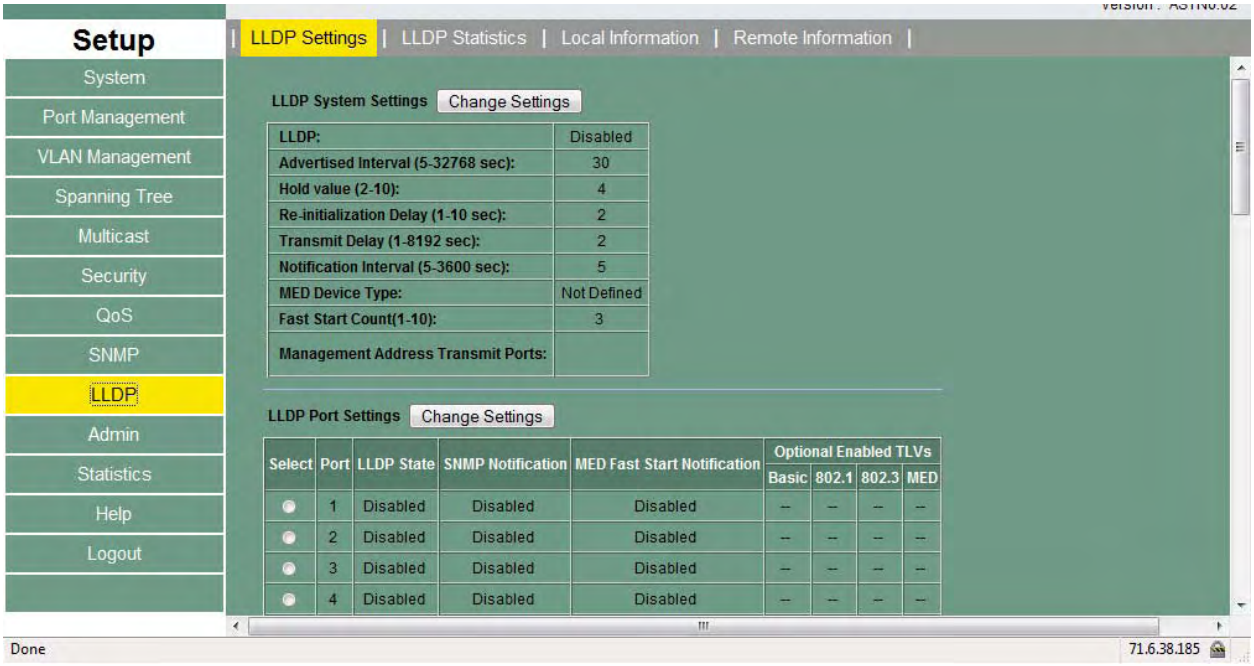


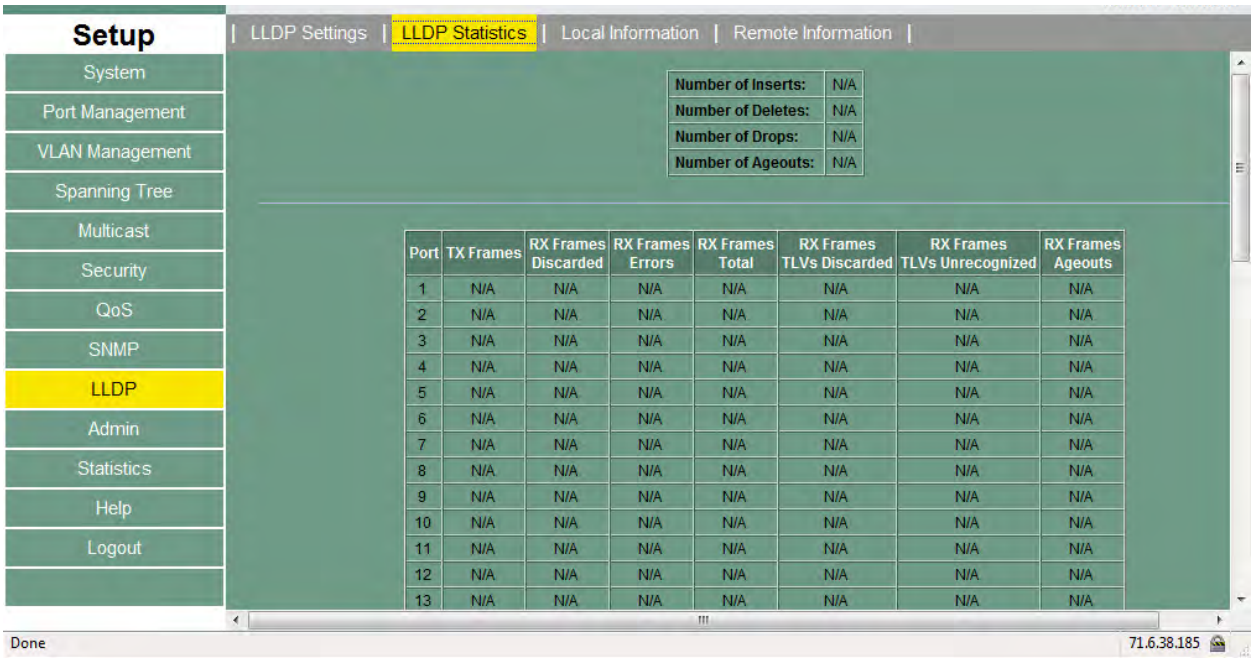
SNMP Continued

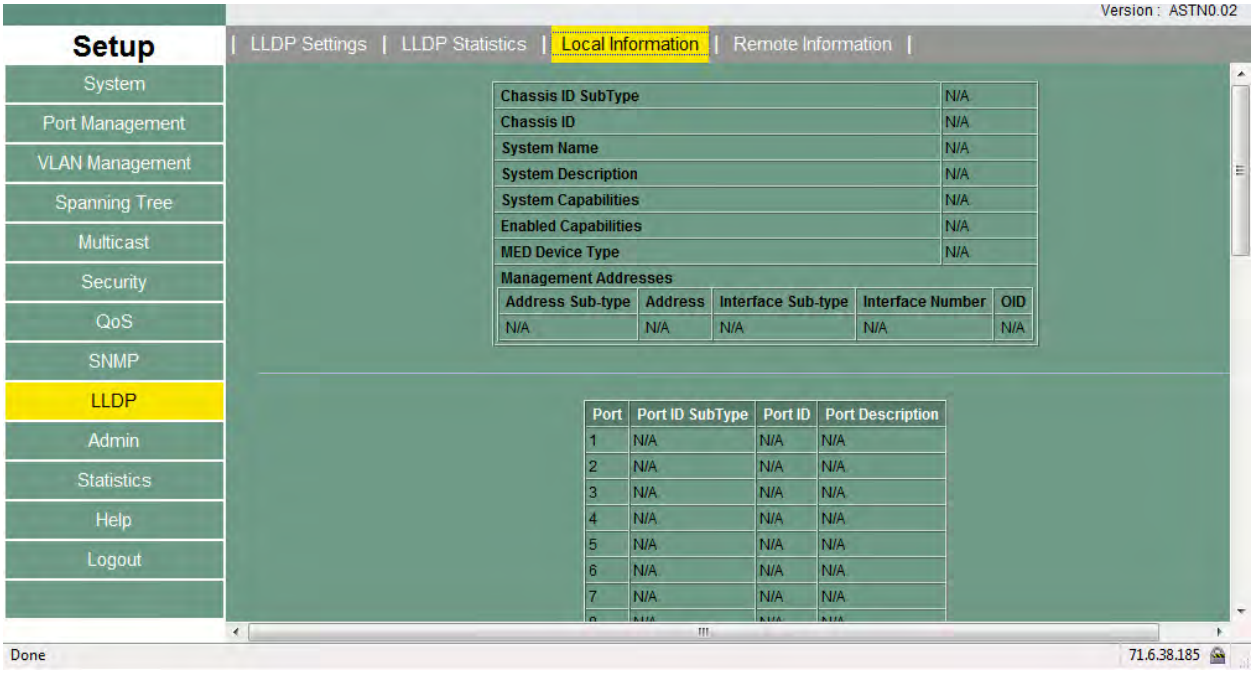


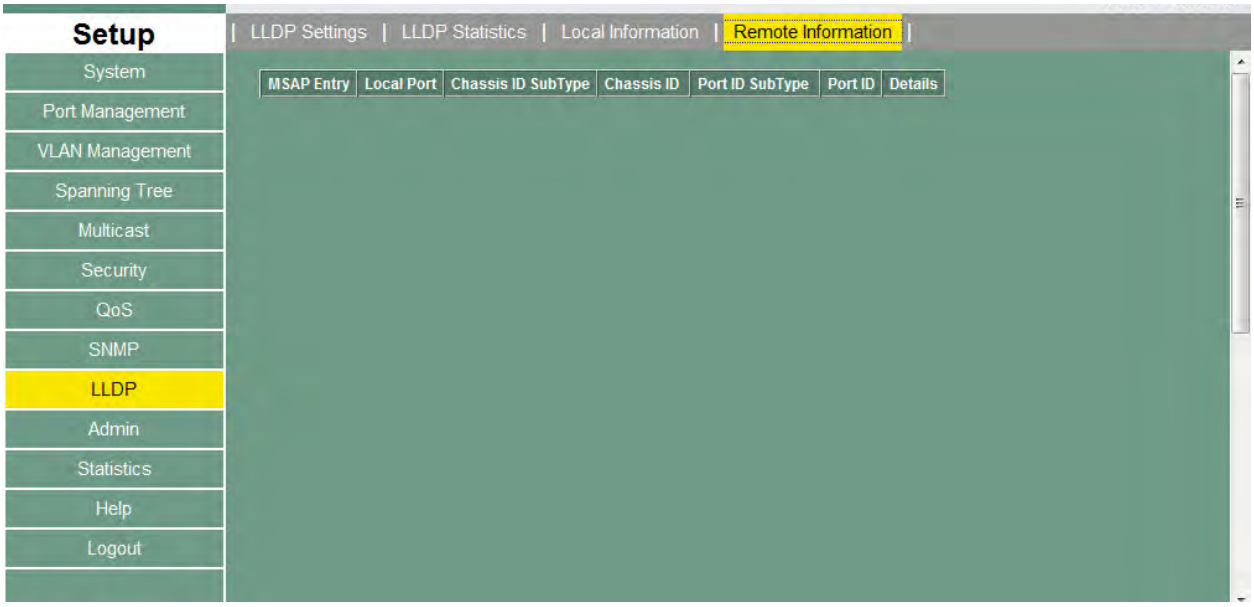


9.10 LLDP


Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
LLDP Settings | LLDP Statistics | Local Information | Remote Information |
LLDP System Settings
Change Settings
LLDP: Disabled
Advertised Interval (5-32768 sec): 30
Hold value (2-10): 4
Re-initialization Delay (1-10 sec): 2
Transmit Delay (1-8192 sec): 2
Notification Interval (5-3600 sec): 5
MED Device Type: Not Defined
Fast Start Count(1-10): 3
Management Address Transmit Ports:
LLDP Port Settings
Change Settings
Select | Port | LLDP State | SNMP Notification | MED Fast Start Notification | Optional Enabled TLVs (Basic | 802.1 | 802.3 | MED)
1 Disabled Disabled Disabled -- -- -- --
2 Disabled Disabled Disabled -- -- -- --
3 Disabled Disabled Disabled -- -- -- --
4 Disabled Disabled Disabled -- -- -- --
Done
71.6.38.185

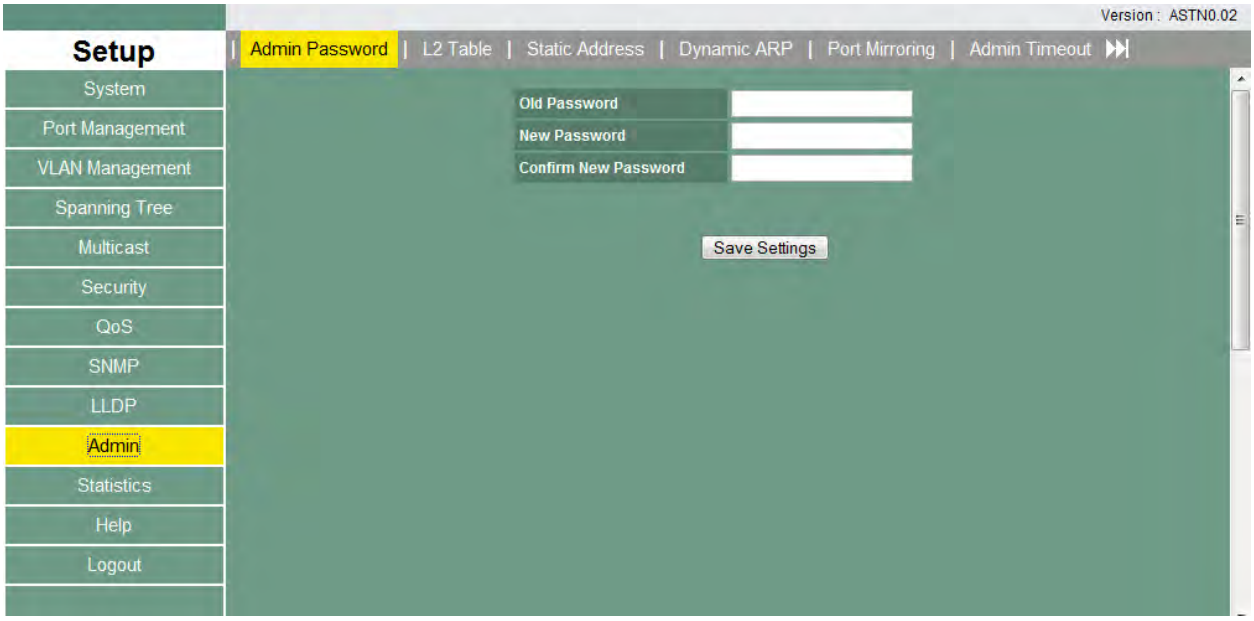

Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
LLDP Settings | LLDP Statistics | Local Information | Remote Information |
Number of Inserts: N/A
Number of Deletes: N/A
Number of Drops: N/A
Number of Ageouts: N/A
Port | TX Frames | RX Frames Discarded | RX Frames Errors | RX Frames Total | RX Frames TLVs Discarded | RX Frames TLVs Unrecognized | RX Frames Ageouts
1 N/A N/A N/A N/A N/A N/A N/A
2 N/A N/A N/A N/A N/A N/A N/A
3 N/A N/A N/A N/A N/A N/A N/A
4 N/A N/A N/A N/A N/A N/A N/A
5 N/A N/A N/A N/A N/A N/A N/A
6 N/A N/A N/A N/A N/A N/A N/A
7 N/A N/A N/A N/A N/A N/A N/A
8 N/A N/A N/A N/A N/A N/A N/A
9 N/A N/A N/A N/A N/A N/A N/A
10 N/A N/A N/A N/A N/A N/A N/A
11 N/A N/A N/A N/A N/A N/A N/A
12 N/A N/A N/A N/A N/A N/A N/A
13 N/A N/A N/A N/A N/A N/A N/A
Done
71.6.38.185


Version : ASTN0.02
Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
LLDP Settings | LLDP Statistics | Local Information | Remote Information |
Chassis ID SubType N/A
Chassis ID N/A
System Name N/A
System Description N/A
System Capabilities N/A
Enabled Capabilities N/A
MED Device Type N/A
Management Addresses
Address Sub-type | Address | Interface Sub-type | Interface Number | OID
N/A | N/A | N/A | N/A | N/A
Port | Port ID SubType | Port ID | Port Description
1 | N/A | N/A | N/A
2 | N/A | N/A | N/A
3 | N/A | N/A | N/A
4 | N/A | N/A | N/A
5 | N/A | N/A | N/A
6 | N/A | N/A | N/A
7 | N/A | N/A | N/A
Done
71.6.38.185

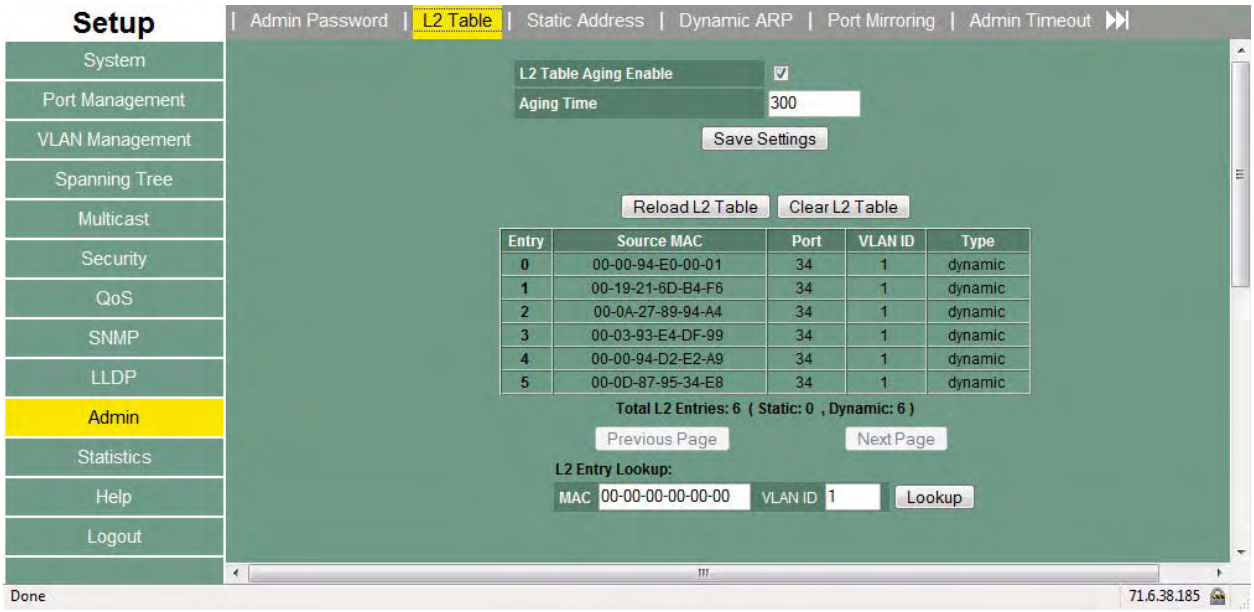

Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
LLDP Settings | LLDP Statistics | Local Information | Remote Information |
MSAP Entry | Local Port | Chassis ID SubType | Chassis ID | Port ID SubType | Port ID | Details

9.11 Admin - Admin Password

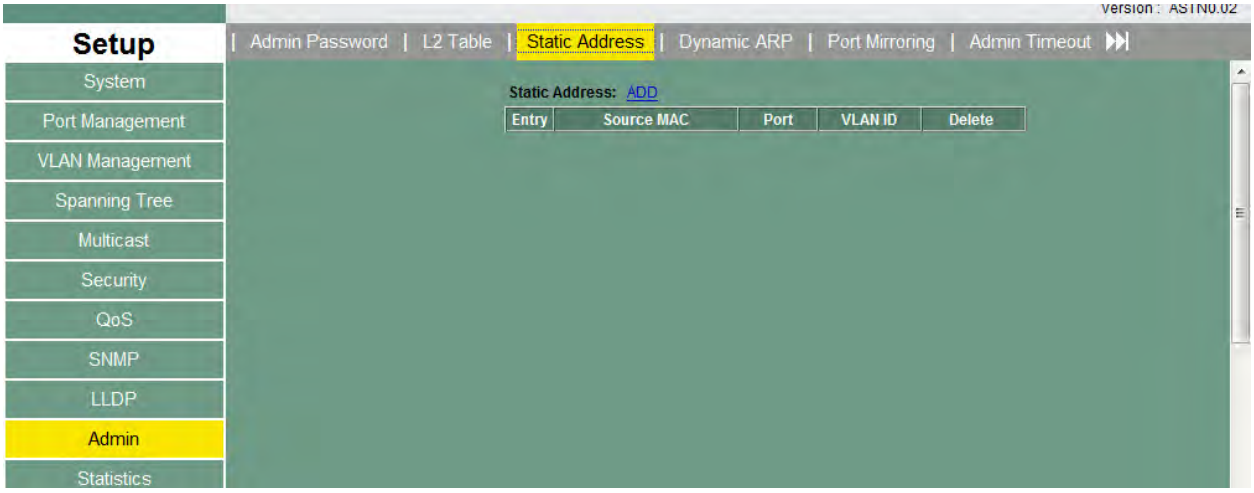
Admin password is the screen that can be used to change the password. Remember to click Save Settings when done.



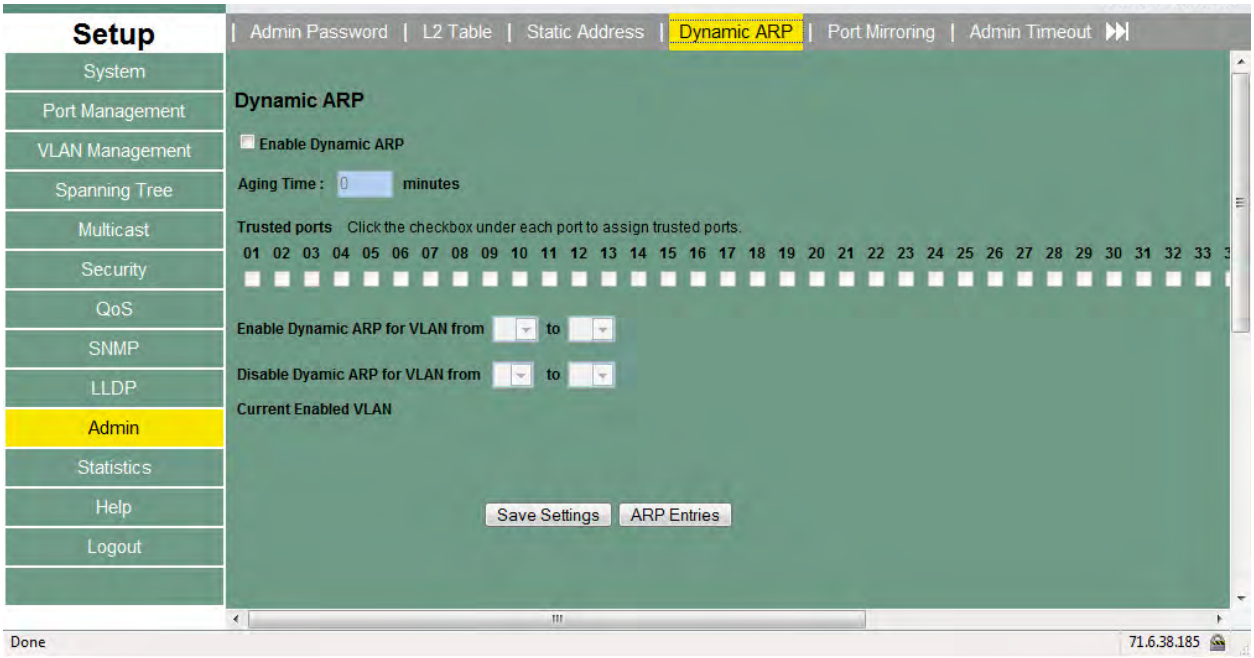
L2 Table makes available MAC addresses and lists the port they are associated with. Aging time can also be specified.



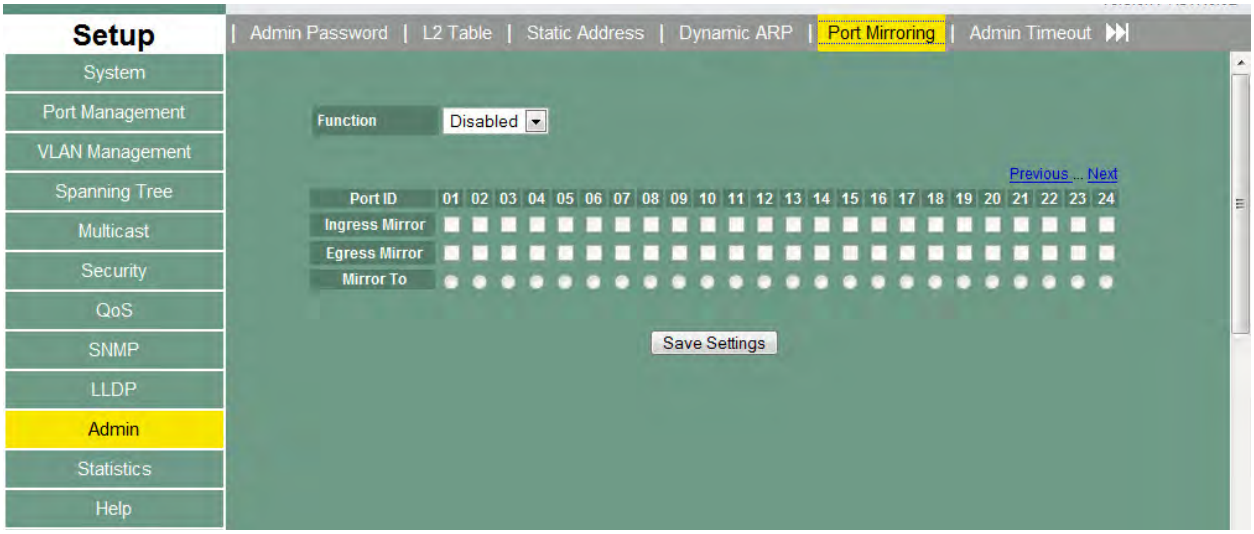
Static addresses can be added using this screen.



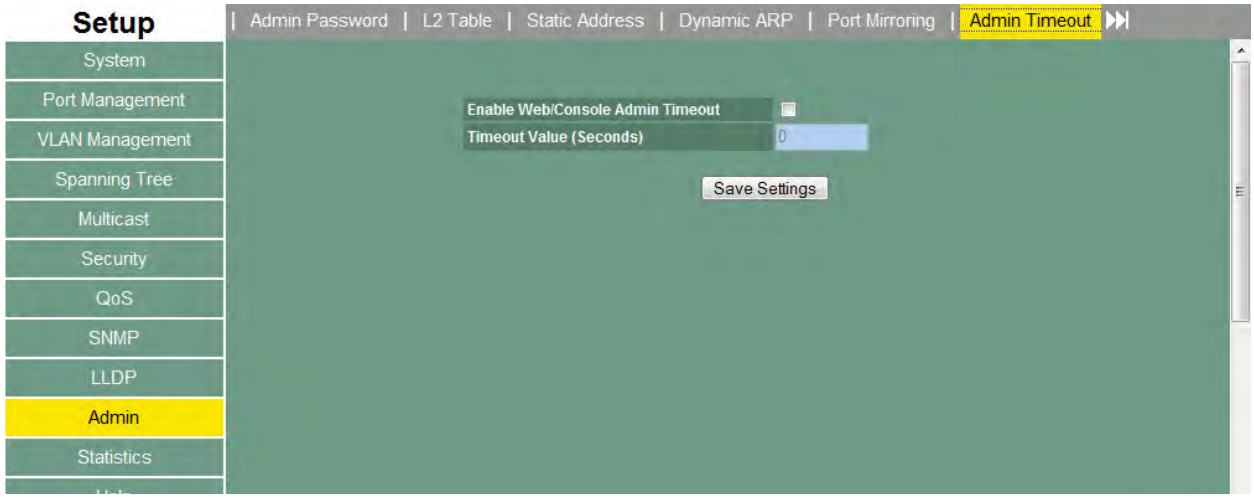
Dynamic ARP is the screen that allows aging time and trusted ports to be set on a per port basis. Click Save Setting when done.


Setup
Admin Password | L2 Table | Static Address | Dynamic ARP | Port Mirroring | Admin Timeout
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
Dynamic ARP
Enable Dynamic ARP
Aging Time : 0 minutes
Trusted ports Click the checkbox under each port to assign trusted ports.
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33
Enable Dynamic ARP for VLAN from to
Disable Dyamic ARP for VLAN from to
Current Enabled VLAN
Save Settings
ARP Entries
Done
71.6.38.185

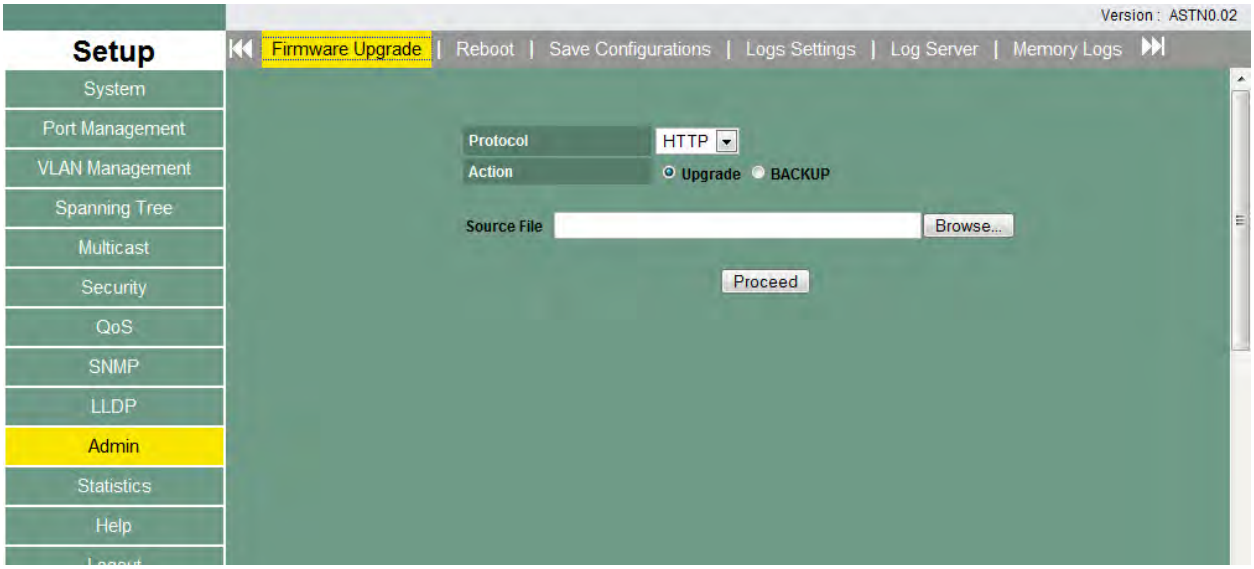
Port Mirroring – To set up a mirror, identify the port to be mirrored by checking the ingress mirror, or egress mirror for the port. Next select the port to mirror the information to.

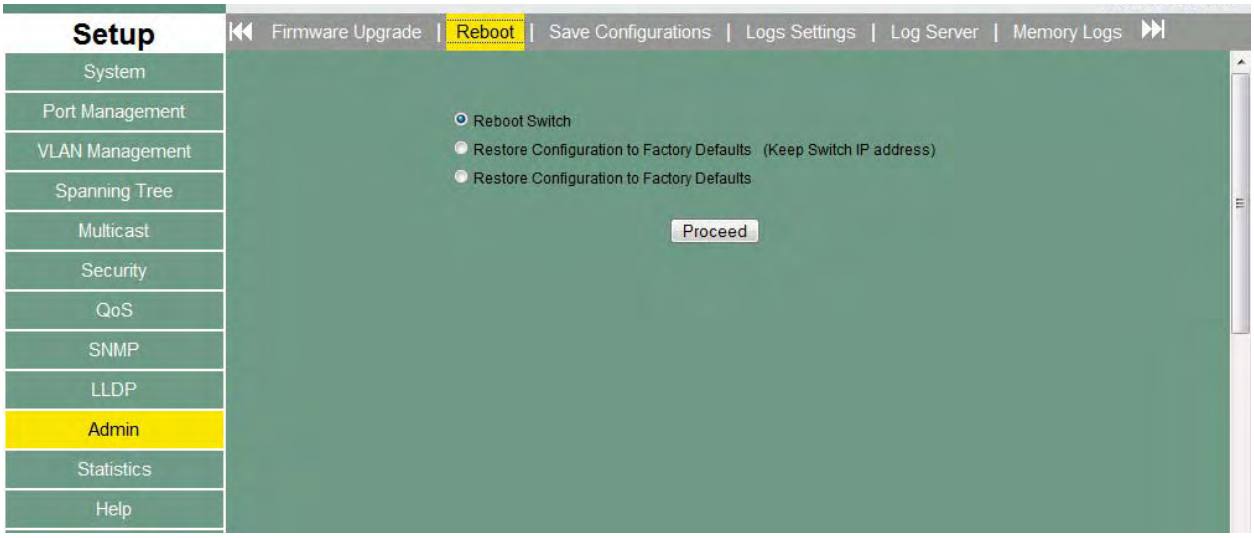


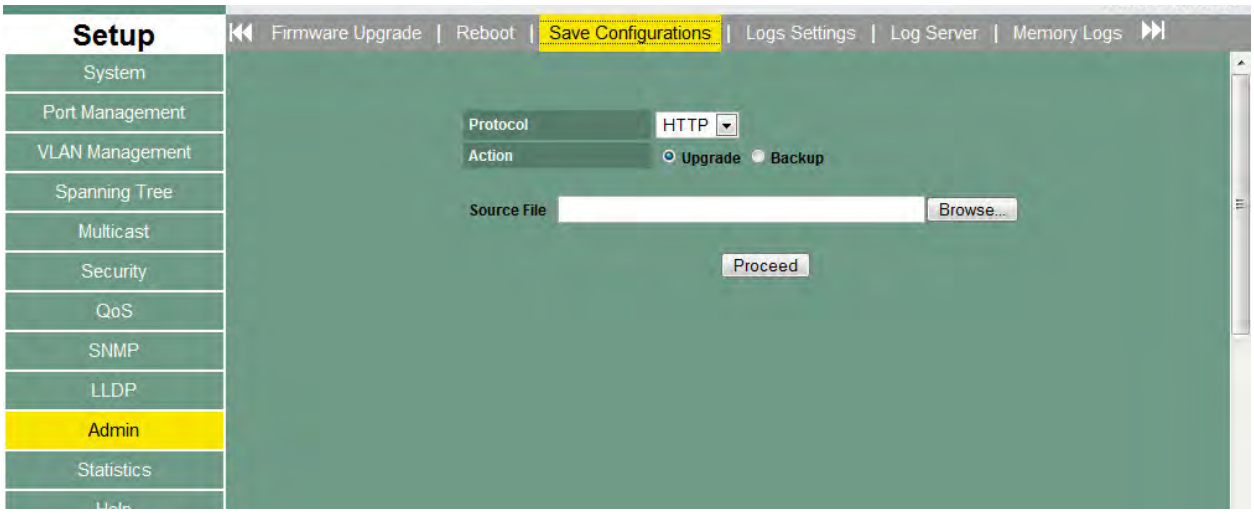
Admin Timeout allows the timeout in seconds to be set before the management session is terminated do to no activity.

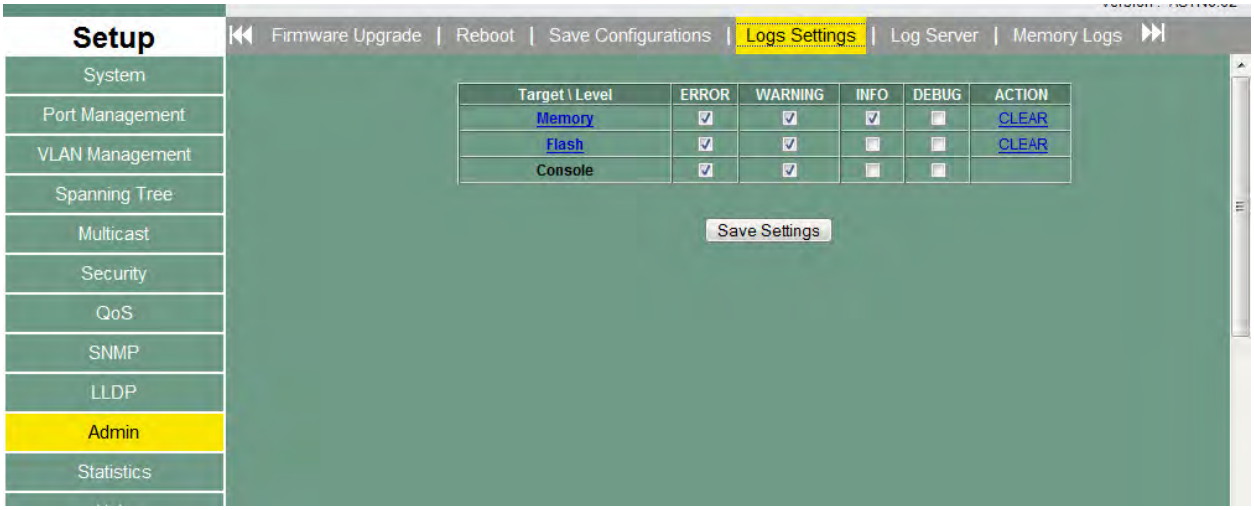


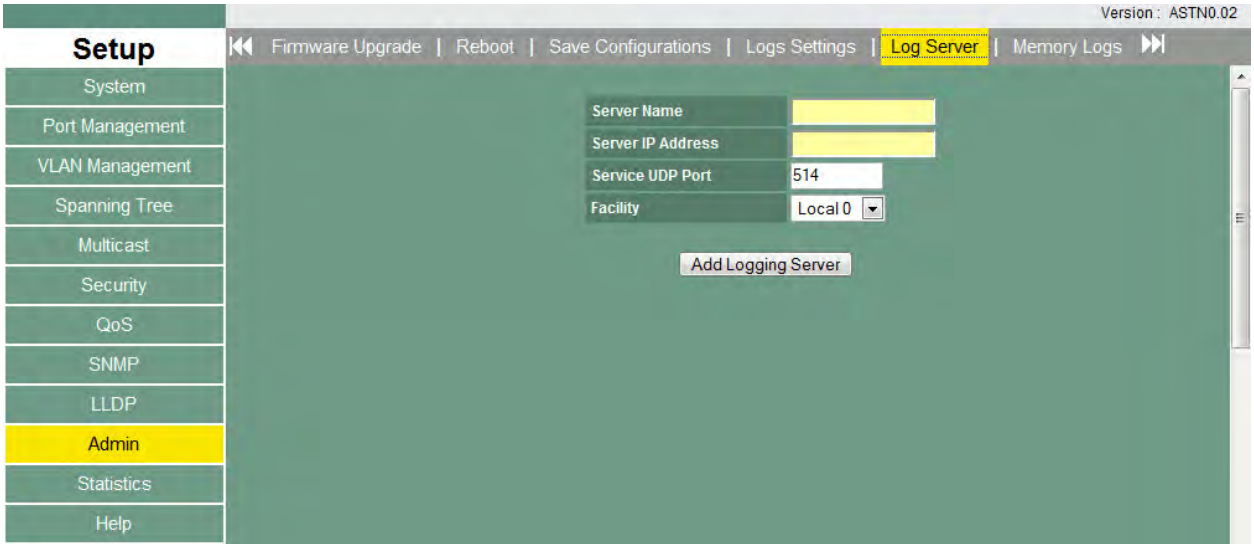
ADMIN Continued – assorted administration functions are controlled using the next several screens.



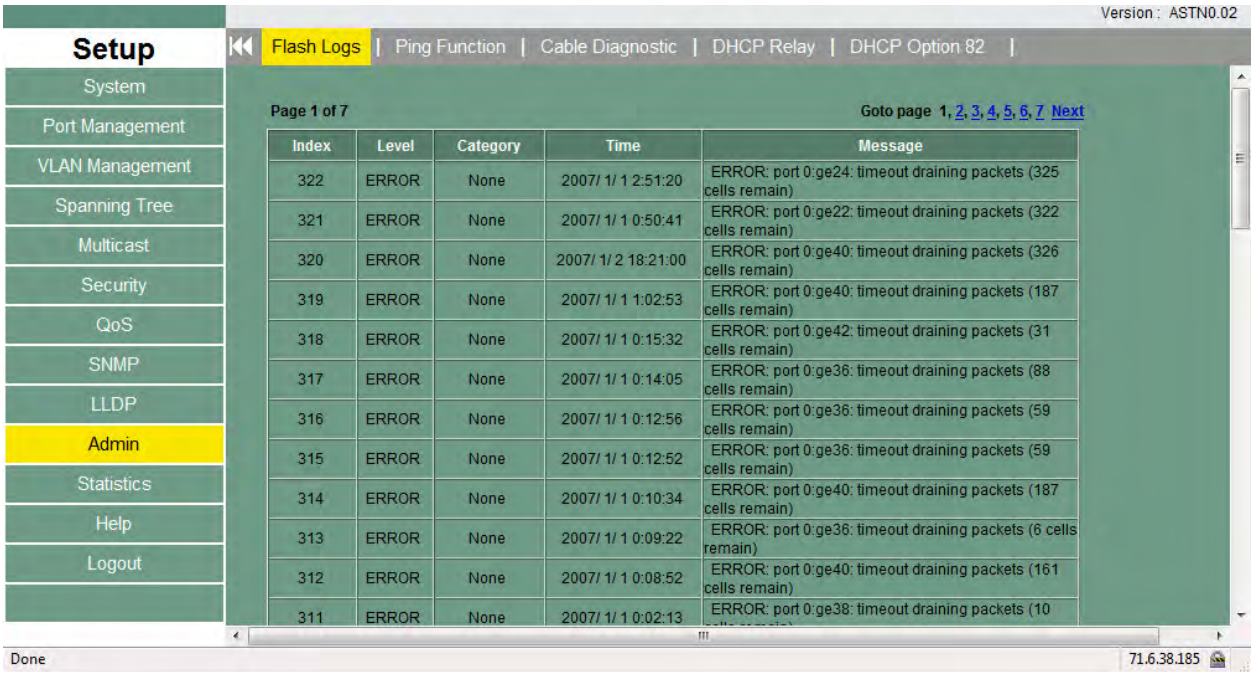


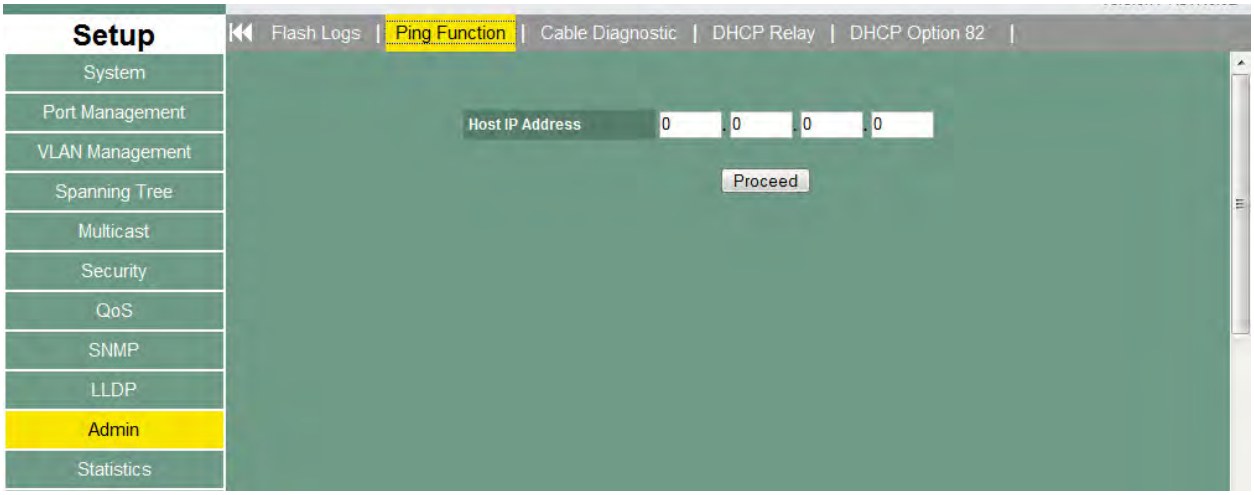

Setup
Firmware Upgrade | Reboot | Save Configurations | Logs Settings | Log Server | Memory Logs
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Protocol
HTTP
Action
Upgrade
Backup
Source File
Browse...
Proceed


Setup
Firmware Upgrade | Reboot | Save Configurations | Logs Settings | Log Server | Memory Logs
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Target \ Level
ERROR
WARNING
INFO
DEBUG
ACTION
Memory
CLEAR
Flash
CLEAR
Console
Save Settings


Version : ASTN0.02
Setup
Firmware Upgrade | Reboot | Save Configurations | Logs Settings | Log Server | Memory Logs
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Server Name
Server IP Address
Service UDP Port
514
Facility
Local 0
Add Logging Server

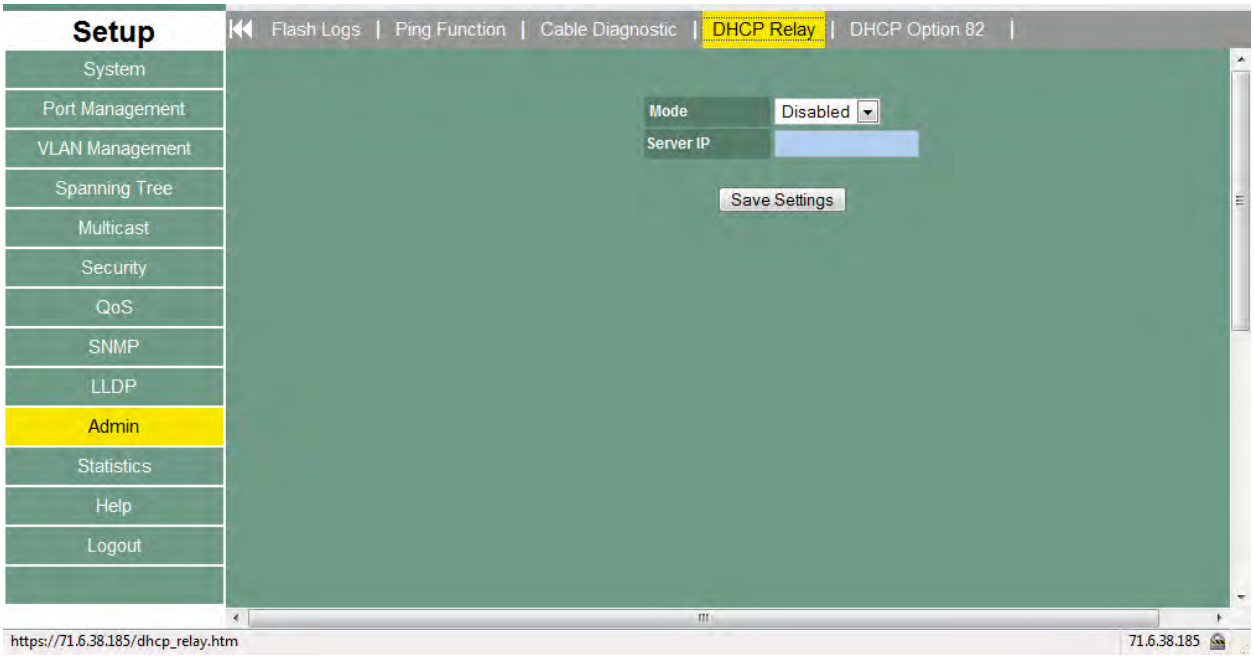
Setup
Firmware Upgrade | Reboot | Save Configurations | Logs Settings | Log Server | Memory Logs
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
349 INFO TELNETD 2007/ 1/ 8 23:18:21 A telnet client dis-connected from 0.0.0.0
348 INFO TELNETD 2007/ 1/ 8 23:18:18 A telnet client connected from 80.8.83.39
347 INFO TELNETD 2007/ 1/ 8 21:48:47 A telnet client dis-connected from 0.0.0.0
346 INFO TELNETD 2007/ 1/ 8 21:48:46 A telnet client connected from 66.243.208.33
345 INFO TELNETD 2007/ 1/ 8 20:01:15 A telnet client dis-connected from 72.27.17.199
344 INFO TELNETD 2007/ 1/ 8 19:58:14 A telnet client connected from 72.27.17.199
343 INFO TELNETD 2007/ 1/ 8 19:43:02 A telnet client dis-connected from 0.0.0.0
342 INFO TELNETD 2007/ 1/ 8 19:42:48 A telnet client connected from 93.124.2.60
341 INFO TELNETD 2007/ 1/ 8 12:47:59 A telnet client dis-connected from 0.0.0.0
340 INFO TELNETD 2007/ 1/ 8 12:47:57 A telnet client connected from 88.73.117.220
339 INFO TELNETD 2007/ 1/ 8 4:06:41 A telnet client dis-connected from 0.0.0.0
338 INFO TELNETD 2007/ 1/ 8 4:06:40 A telnet client connected from 217.44.230.198
337 INFO TELNETD 2007/ 1/ 8 1:00:10 A telnet client dis-connected from 72.27.149.31
336 INFO TELNETD 2007/ 1/ 8 1:00:05 A telnet client connected from 72.27.149.31
335 INFO TELNETD 2007/ 1/ 7 8:09:53 A telnet client dis-connected from 0.0.0.0
Waiting for 71.6.38.185...
71.6.38.185

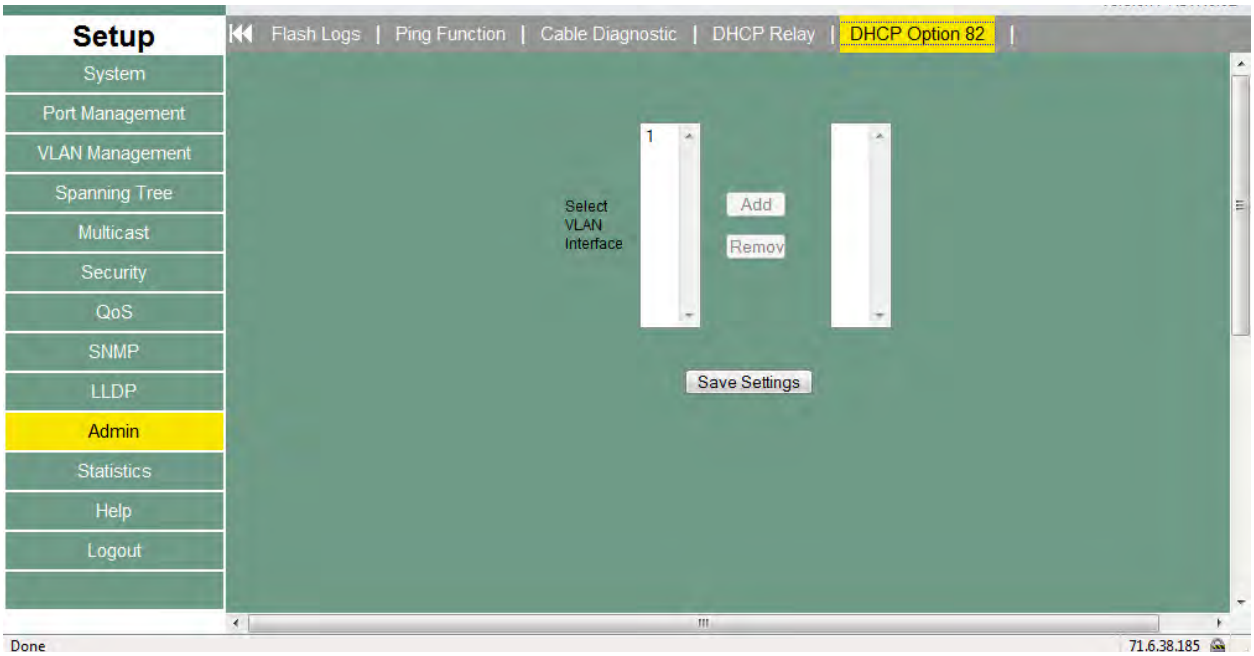

Version : ASTN0.02
Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
Flash Logs | Ping Function | Cable Diagnostic | DHCP Relay | DHCP Option 82 |
Page 1 of 7
Goto page 1, 2, 3, 4, 5, 6, 7 Next
Index | Level | Category | Time | Message
322 | ERROR | None | 2007/ 1/ 1 2:51:20 | ERROR: port 0:ge24: timeout draining packets (325 cells remain)
321 | ERROR | None | 2007/ 1/ 1 0:50:41 | ERROR: port 0:ge22: timeout draining packets (322 cells remain)
320 | ERROR | None | 2007/ 1/ 2 18:21:00 | ERROR: port 0:ge40: timeout draining packets (326 cells remain)
319 | ERROR | None | 2007/ 1/ 1 1:02:53 | ERROR: port 0:ge40: timeout draining packets (187 cells remain)
318 | ERROR | None | 2007/ 1/ 1 0:15:32 | ERROR: port 0:ge42: timeout draining packets (31 cells remain)
317 | ERROR | None | 2007/ 1/ 1 0:14:05 | ERROR: port 0:ge36: timeout draining packets (88 cells remain)
316 | ERROR | None | 2007/ 1/ 1 0:12:56 | ERROR: port 0:ge36: timeout draining packets (59 cells remain)
315 | ERROR | None | 2007/ 1/ 1 0:12:52 | ERROR: port 0:ge36: timeout draining packets (59 cells remain)
314 | ERROR | None | 2007/ 1/ 1 0:10:34 | ERROR: port 0:ge40: timeout draining packets (187 cells remain)
313 | ERROR | None | 2007/ 1/ 1 0:09:22 | ERROR: port 0:ge36: timeout draining packets (6 cells remain)
312 | ERROR | None | 2007/ 1/ 1 0:08:52 | ERROR: port 0:ge40: timeout draining packets (161 cells remain)
311 | ERROR | None | 2007/ 1/ 1 0:02:13 | ERROR: port 0:ge38: timeout draining packets (10
Done
71.6.38.185


Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Flash Logs | Ping Function | Cable Diagnostic | DHCP Relay | DHCP Option 82 |
Host IP Address
0 . 0 . 0 . 0
Proceed

Cable diagnostic a cable test that can be run for each port.

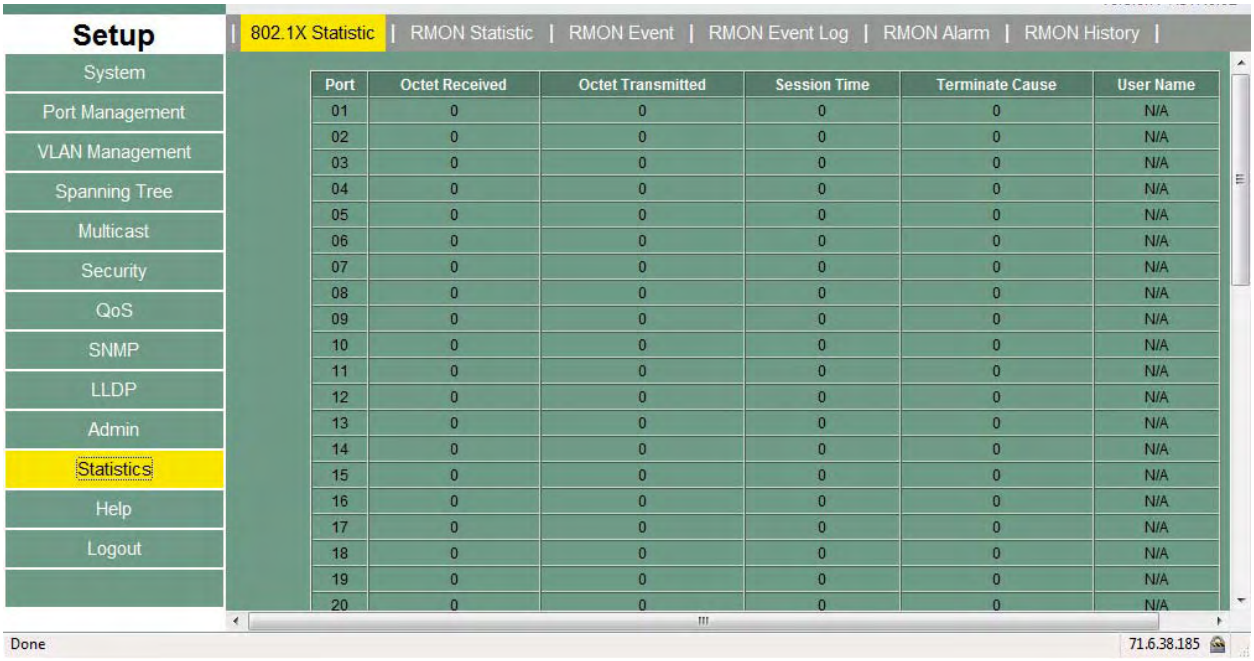
DHCP Relay/ DCP Option 82 – these screens control the relay of DHCP information from a server. VLANS can also be specified to receive DHCP information.

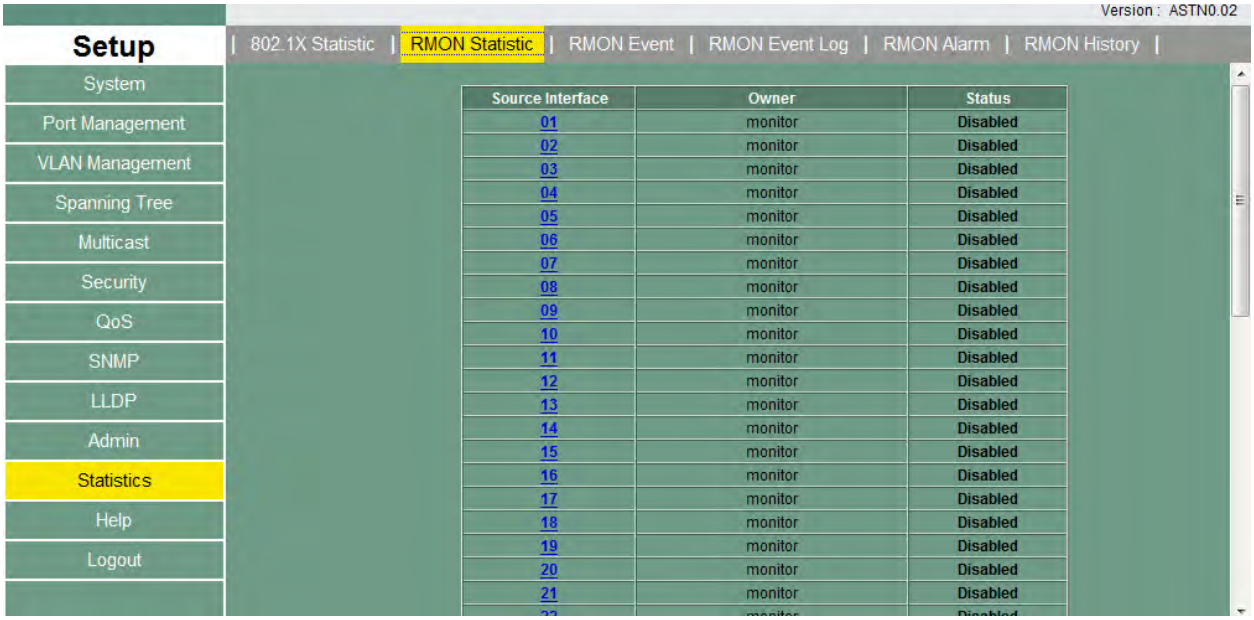


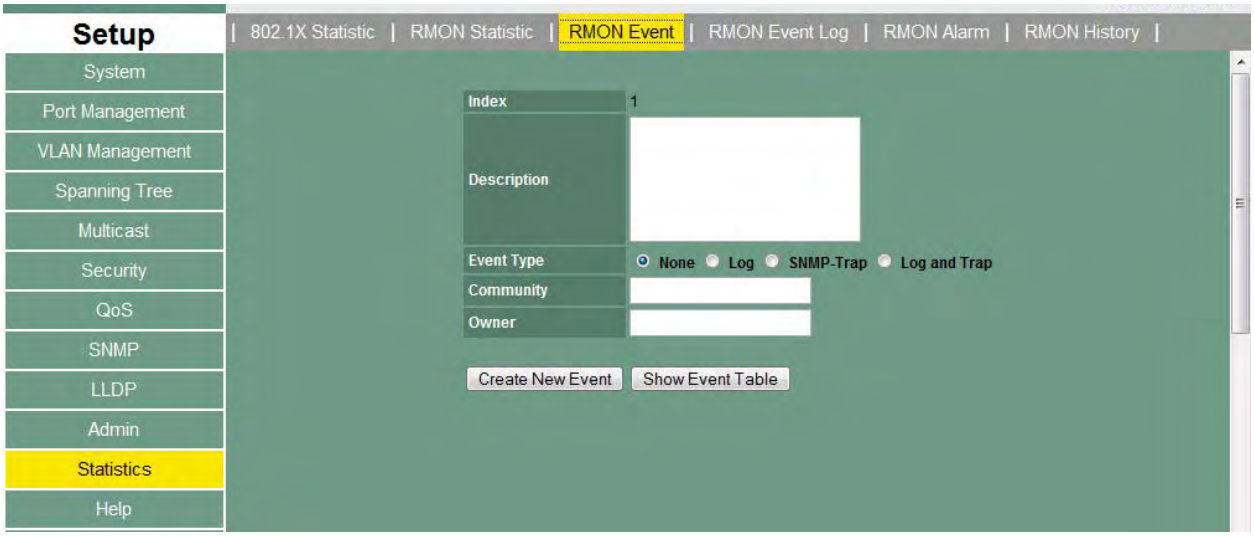


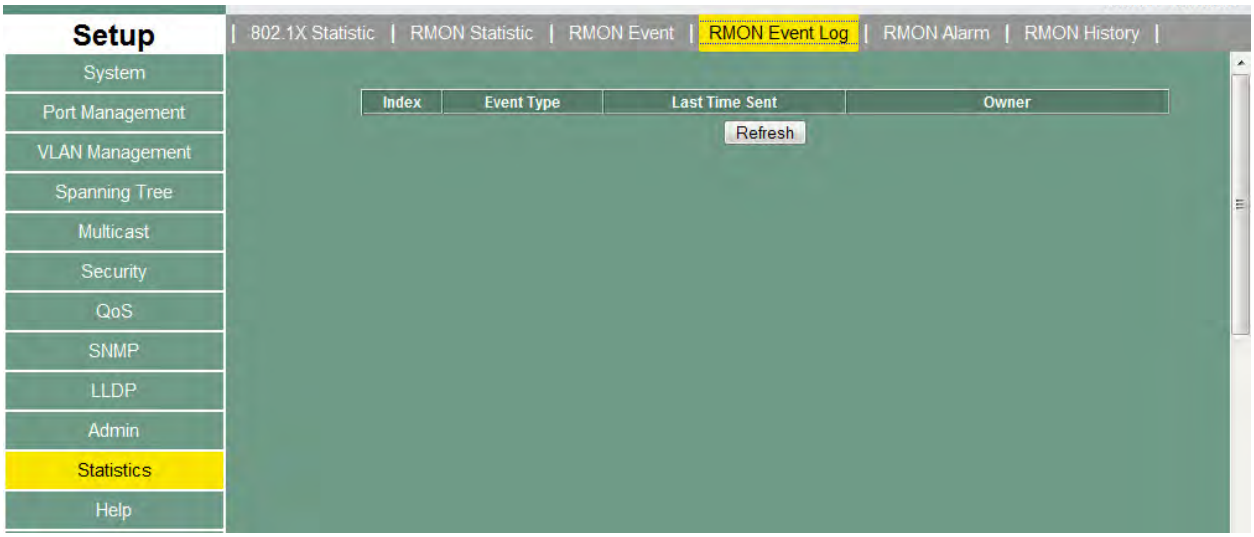
9.12 Statistics

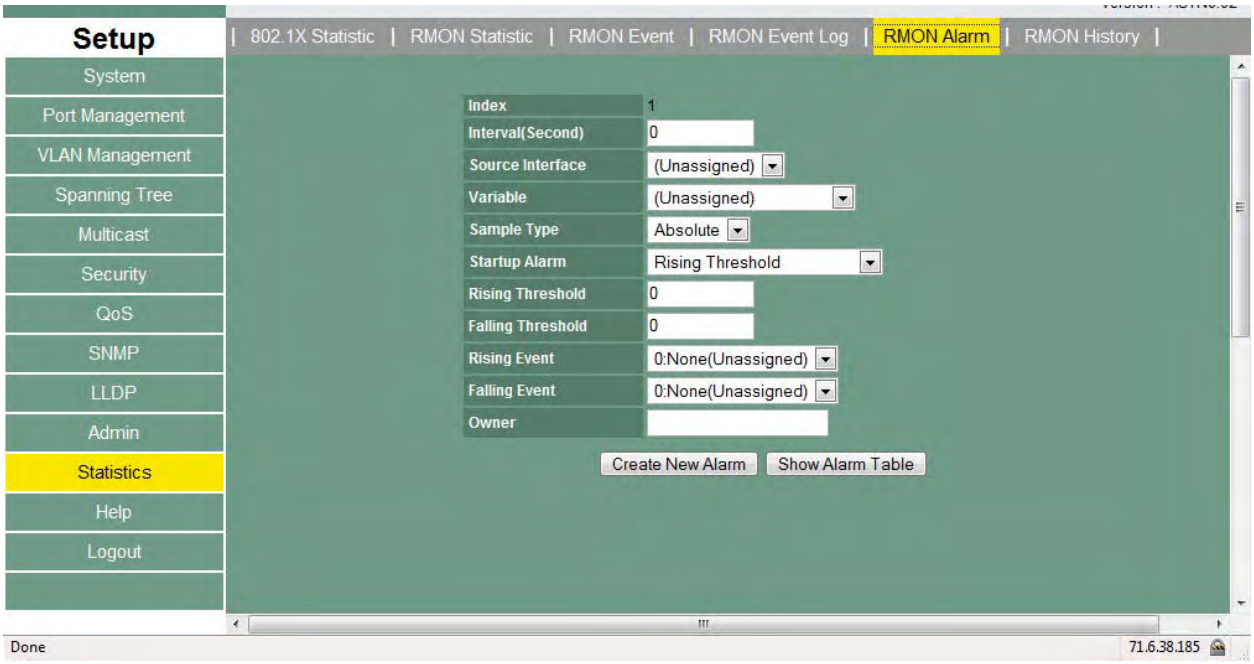
RMON information and settings are controlled using the next screens. General counters and timers are also displayed.

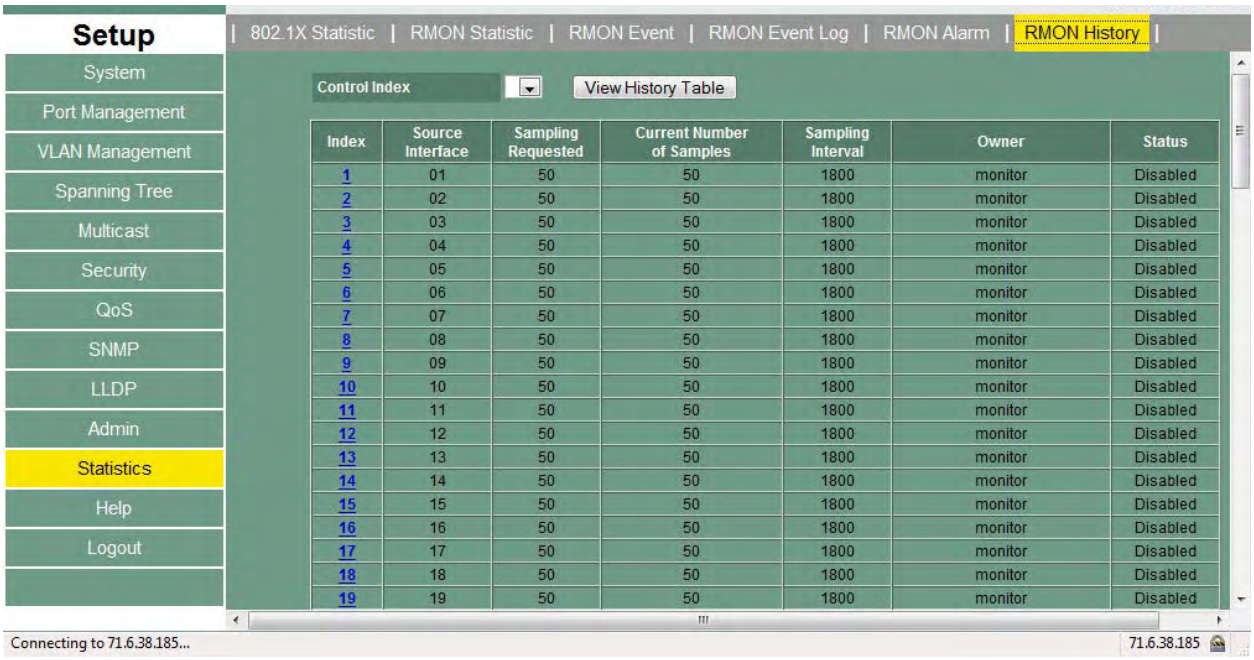

Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
802.1X Statistic | RMON Statistic | RMON Event | RMON Event Log | RMON Alarm | RMON History
Port | Octet Received | Octet Transmitted | Session Time | Terminate Cause | User Name
01 0 0 0 0 N/A
02 0 0 0 0 N/A
03 0 0 0 0 N/A
04 0 0 0 0 N/A
05 0 0 0 0 N/A
06 0 0 0 0 N/A
07 0 0 0 0 N/A
08 0 0 0 0 N/A
09 0 0 0 0 N/A
10 0 0 0 0 N/A
11 0 0 0 0 N/A
12 0 0 0 0 N/A
13 0 0 0 0 N/A
14 0 0 0 0 N/A
15 0 0 0 0 N/A
16 0 0 0 0 N/A
17 0 0 0 0 N/A
18 0 0 0 0 N/A
19 0 0 0 0 N/A
20 0 0 0 0 N/A
Done
71.6.38.185


Version : ASTN0.02
Setup
802.1X Statistic | RMON Statistic | RMON Event | RMON Event Log | RMON Alarm | RMON History
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
Source Interface | Owner | Status
01 monitor Disabled
02 monitor Disabled
03 monitor Disabled
04 monitor Disabled
05 monitor Disabled
06 monitor Disabled
07 monitor Disabled
08 monitor Disabled
09 monitor Disabled
10 monitor Disabled
11 monitor Disabled
12 monitor Disabled
13 monitor Disabled
14 monitor Disabled
15 monitor Disabled
16 monitor Disabled
17 monitor Disabled
18 monitor Disabled
19 monitor Disabled
20 monitor Disabled
21 monitor Disabled


Setup
802.1X Statistic | RMON Statistic | RMON Event | RMON Event Log | RMON Alarm | RMON History
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Index 1
Description
Event Type None Log SNMP-Trap Log and Trap
Community
Owner
Create New Event
Show Event Table

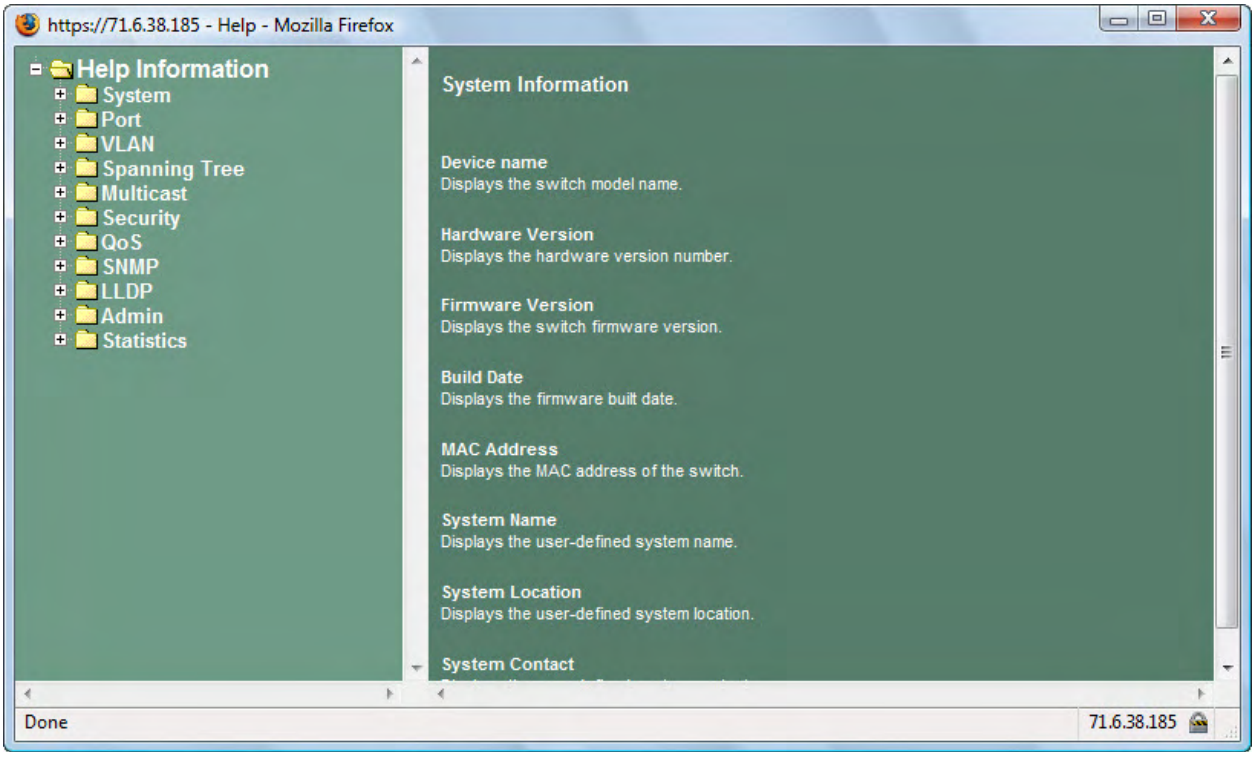

Setup
802.1X Statistic | RMON Statistic | RMON Event | RMON Event Log | RMON Alarm | RMON History
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Index
Event Type
Last Time Sent
Owner
Refresh


Setup
802.1X Statistic | RMON Statistic | RMON Event | RMON Event Log | RMON Alarm | RMON History
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
Index 1
Interval(Second) 0
Source Interface (Unassigned)
Variable (Unassigned)
Sample Type Absolute
Startup Alarm Rising Threshold
Rising Threshold 0
Falling Threshold 0
Rising Event 0:None(Unassigned)
Falling Event 0:None(Unassigned)
Owner
Create New Alarm
Show Alarm Table
Done
71.6.38.185


Setup
System
Port Management
VLAN Management
Spanning Tree
Multicast
Security
QoS
SNMP
LLDP
Admin
Statistics
Help
Logout
802.1X Statistic | RMON Statistic | RMON Event | RMON Event Log | RMON Alarm | RMON History
Control Index
View History Table
Index | Source Interface | Sampling Requested | Current Number of Samples | Sampling Interval | Owner | Status
1 | 01 | 50 | 50 | 1800 | monitor | Disabled
2 | 02 | 50 | 50 | 1800 | monitor | Disabled
3 | 03 | 50 | 50 | 1800 | monitor | Disabled
4 | 04 | 50 | 50 | 1800 | monitor | Disabled
5 | 05 | 50 | 50 | 1800 | monitor | Disabled
6 | 06 | 50 | 50 | 1800 | monitor | Disabled
7 | 07 | 50 | 50 | 1800 | monitor | Disabled
8 | 08 | 50 | 50 | 1800 | monitor | Disabled
9 | 09 | 50 | 50 | 1800 | monitor | Disabled
10 | 10 | 50 | 50 | 1800 | monitor | Disabled
11 | 11 | 50 | 50 | 1800 | monitor | Disabled
12 | 12 | 50 | 50 | 1800 | monitor | Disabled
13 | 13 | 50 | 50 | 1800 | monitor | Disabled
14 | 14 | 50 | 50 | 1800 | monitor | Disabled
15 | 15 | 50 | 50 | 1800 | monitor | Disabled
16 | 16 | 50 | 50 | 1800 | monitor | Disabled
17 | 17 | 50 | 50 | 1800 | monitor | Disabled
18 | 18 | 50 | 50 | 1800 | monitor | Disabled
19 | 19 | 50 | 50 | 1800 | monitor | Disabled
Connecting to 71.6.38.185...
71.6.38.185

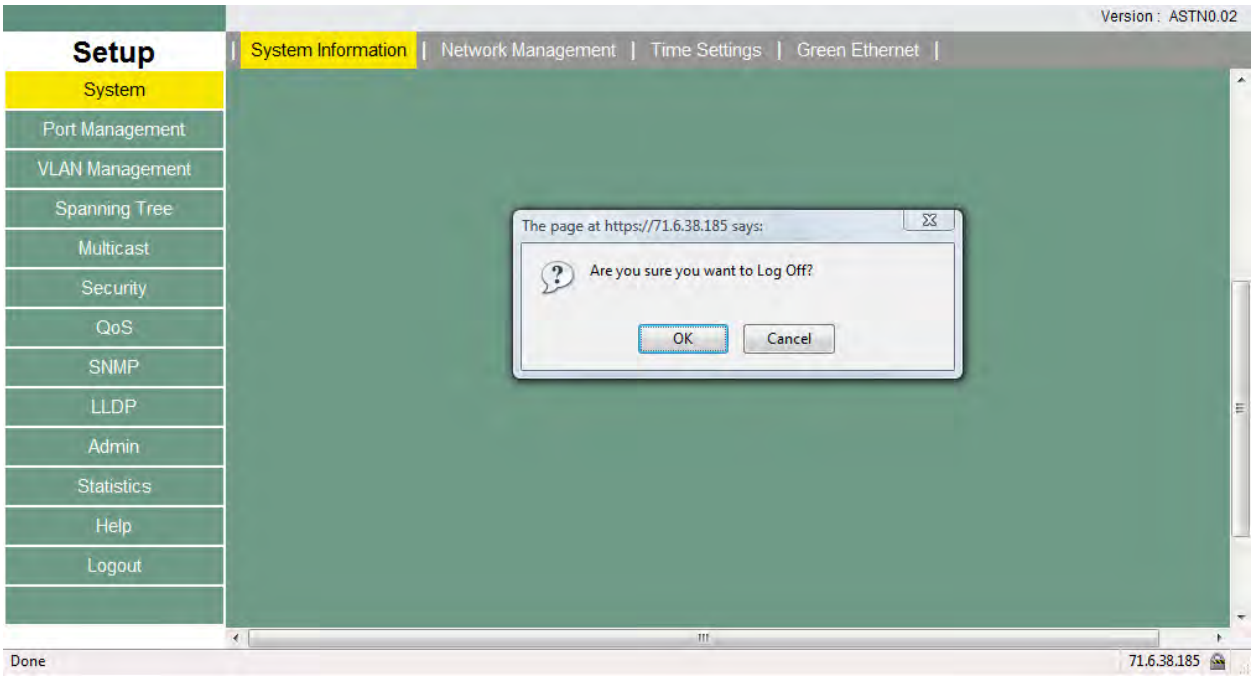
9.13 Help

General help is available for many screens.



9.14 Logout

Use this screen to logout and close the session.



Chapter 10: CLI Commands

The CLI is divided into various modes. The Commands in one mode are not available until the operator switches to that particular mode. The commands available to the operator at any point in time depend upon the mode. Entering a question mark (?) at the CLI prompt, and displays a list of the available commands and descriptions of the commands.
The CLI provides the following modes.

10.1 Modes

When the operator logs into the CLI, the User Mode is the initial mode. The User Mode contains a limited set of commands. The command prompt shown at this level is:
Command Prompt: COMMAND>
Privileged Mode
To have access to the full suite of commands, the operator must enter the Privileged Mode. The Privileged Mode requires password authentication. From Privileged Mode, the operator can issue any Exec command to enter the Global Configuration mode. The command prompt shown at this level is:
Command Prompt: Switch#
Global Config Mode
This mode permits the operator to make modifications to the running configuration. General setup commands are grouped in this mode. From the Global Configuration mode, the operator can enter the Interface Configuration mode. The command prompt at this level is:
Command Prompt: Switch(Config)#
From the Global Config mode, the operator may enter the following configuration modes:
14
Interface Config Mode
Many features are enabled for a particular interface. The Interface commands enable or modify the operation of an interface. In this mode, a physical port is set up for a specific logical connection operation. The command prompt at this level is:
Command Prompt: Switch(Interface <*port*#>)#

10.2 User Mode commands

10.2.1 Help
This command displays help information
Format help
Mode User Mode
10.2.2 ?
This command displays help information
Format help
Mode User Mode
10.2.3 logout
This command is used to exit from the telnet
Format logout
Mode User Mode
10.2.4 ping
This command sends echo messages.

Format ping <*A.B.C.D*>
Mode User Mode
10.2.5 show
1）show port
This command displays port status.
Format show port {<*port#*> | all}
Mode User Mode
2 ）show network
This command displays switch IP configuration
Format show network
Mode User Mode
3）show system
This command displays system information.
Format show system
Mode User Mode
4） show port statistics
This command displays port statistics.
Format show port statistics {<*port#*> | all}
Mode User Mode
10.2.6 enable
Enter to the Privileged Mode
Format enable
Mode User Mode

10.3 Privileged Mode commands

10.3.1 cable-diag
15
This command is used to proceed cable diagnostic
Format cable-diag port <*port ID*>
Mode Privileged Mode
e.g. Switch#cable-diag port 1
10.3.2 clear
10.3.2.1 clear arl
This command is used to clear ARL table entries
Format clear arl
Mode Privileged Mode
1) clear arl dynamic
This command is used to Clear dynamic arl table entries
Format clear arl dynamic
Mode Privileged Mode
2) clear arl static
This command is used to clear static arl table entries
Format clear arl static mac <*mac-addr*>
Mode Privileged Mode
10.3.2.2 clear config
This command is used to restore switch factory default configuration
Format clear config
Mode Privileged Mode
10.3.2.3 clear counters
This command is used to clear RMON statistics for entire switch
Format clear counters
Mode Privileged Mode
10.3.2.4 clear IGMPsnooping
This command is used to restore igmpsnooping configuration to factory default

Format clear igmpsnooping
Mode Privileged Mode
10.3.2.5 clear static-mcast
This command is used to clear static multicast groups
Format clear static-mcast
Mode Privileged Mode
10.3.2.6 clear pass
This command is used to restore administrator's password to factory default
Format clear pass
Mode Privileged Mode
10.3.2.7 clear lacp
This command is used to restore LAG and LACP configuration to factory default
Format clear lacp
Mode Privileged Mode
10.3.2.8 clear logs
This command is used to clear memory/flash logs
Format clear logs
Mode Privileged Mode
10.3.2.9 clear VLAN
This command is used to delete all VLAN groups
Format clear vlan
16
Mode Privileged Mode
10.3.2.10 configuration
Enter into Global Configuration mode
Format configuration
Mode Privileged Mode
10.3.4 copy
This command is used to upload file from switch to host, or download file to switch from host
10.3.4.1 copy nvram_config
This command is used to backup switch configuration
Format copy nvram_config tftp <*A.B.C.D*> file <*filename*>
Mode Privileged Mode
e.g. Switch#copy nvram_config tftp 192.168.1.100 file switch_configuration
10.3.4.2 copy system_image
This command is used to backup switch runtime image
Format copy system_image tftp <*A.B.C.D*> <*filename*>
Mode Privileged Mode
e.g. Switch#copy system_image tftp 192.168.1.100 image_file
10.3.4.3 copy tftp
This command is used to upload configuration or runtime image
Format copy tftp <*A.B.C.D*> file <*filename*> {nvram_config | system_image}
Mode Privileged Mode
e.g. Switch#copy tftp 192.168.1.100 file switch_configuration nvram_config
Switch#copy tftp 192.168.1.100 file runtime_code system_image
10.3.5 exit
This command is used to exit current shell
Format exit
Mode Privileged Mode
10.3.6 help
This command displays help information
Format help
Mode Privileged Mode
10.3.7 logout

This command is used to exit current shell
Format logout
Mode Privileged Mode
10.3.8 ping
This command is used to proceed ping destination host
Format ping <*A.B.C.D*>
Mode Privileged Mode
10.3.9 reload
This command is used to reboot system
Format reload
Mode Privileged Mode
17
10.3.10 save
This command is used to save configuration
Format save
Mode Privileged Mode
10.3.11 show
This command is used to show configured data
10.3.11.1 show qos
This command display class of service information
1) show qos cos
This command display the cos mapping
Format show qos cos
Mode Privileged Mode
2) show qos queue-settings
This command display the queue-settings mapping
Format show qos queue-settings
Mode Privileged Mode
3) show qos advanced
This command display qos advanced mode information
show qos advanced mode
This command display mode of qos
Format show qos advanced mode
Mode Privileged Mode
show qos advanced dscp
This command display qos dscp mapping
Format show qos advanced dscp
Mode Privileged Mode
show qos advanced ip-precedence
This command display qos ip precedence mapping
Format show qos advanced ip-precedence
Mode Privileged Mode
4) show qos port-based
This command is used to display class of service information
show qos port-based port
This command display class of service information
Format show qos port-based port <*port-ID*>
Mode Privileged Mode
show qos port-based all
This command display all switch interfaces' cos settings
Format show qos port-based all
Mode Privileged Mode
10.3.11.2 show dot1x
This command display dot1x information
18
1) show dot1x config

This command display dot1x and port configuration
Format show dot1x config
Mode Privileged Mode
2) show dot1x radius
This command display radius configuration
Format show dot1x radius
Mode Privileged Mode
3) show dot1x statistics
This command display dot1x statistics
Format show dot1x statistics
Mode Privileged Mode
10.3.11.3 show igmp snooping
This command display IGMP snooping information
1) show igmp snooping dynamic_router_port
This command display dynamic router ports information
Format show *igmp* snooping dynamic_router_port
Mode Privileged Mode
2) show IGMP snooping groups
This command is used to display *igmp* groups information
Format show IGMP snooping groups
Mode Privileged Mode
10.3.11.4 show interface
This command is used to display summary statistics
1) show interface history
This command is used to display port RX and TX
Format show interface history <*port-ID*>
Mode Privileged Mode
2) show interface statistics
This command is used to display port summary statistics
Format show interface statistics <*port-ID*>
Mode Privileged Mode
10.3.11.5 show lag
This command is used to display link aggregation groups information
1) show lag lag-index
This command is used to specify an switch lag
Format show lag lag-index <*port-ID*>
Mode Privileged Mode
2) show lag all
This command is used to display all switch lag
Format show lag all <*port-ID*>
Mode Privileged Mode
10.3.11.6 show lldp
This command is use to display lldp statistics
1) show lldp statistic
This command is used to display lldp statistic
Format show lldp statistic
19
Mode Privileged Mode
2) show lldp local
This command is used to display local information
Format show lldp local
Mode Privileged Mode
3) show lldp msap
This command is used to display msap information
Format show lldp msap
Mode Privileged Mode

4) show lldp msap-entry
This command is used to display msap details information
Format show lldp msap-entry <*1..26*>
Mode Privileged Mode
10.3.11.7 show logging
This command is used to display trap records
1) show logging memory-log
This command display memory log
Format show logging memory-log
Mode Privileged Mode
2) show logging flash-log
This command display flash logs
Format show logging flash-log
Mode Privileged Mode
10.3.11.8 show monitor
This command is used to display port mirroring settings
Format show monitor
Mode Privileged Mode
10.3.11.9 show network
This command is used to configuration for inband connectivity
Format show network
Mode Privileged Mode
10.3.11.10 show port
This command is used to display port mode and settings, display port status
1) show port port-index
This command is used to specify an switch interface
Format show port port-index <*port-ID*>
Mode Privileged Mode
show port all
This command is used to display all switch interface
Format show port all
Mode Privileged Mode
10.3.11.11 show port-security
This command is used to display port security settings
1) show port-security port
This command is used to specify an switch interface
Format show port-security port <*port-ID*>
20
Mode Privileged Mode
2) show port-security all
This command is used to display all interfaces' status
Format show port-security all
Mode Privileged Mode
10.3.11.12 show rate-limit
This command is used to ingress and egress rate limit information
1) show rate-limit port
This command is used to specify an switch interface
Format show rate-limit port <*port-ID*>
Mode Privileged Mode
e.g. Switch#Show rate-limit port 1
Switch#Show rate-limit port g1
2) show rate-limit all
This command is used to display all interfaces' status
Format show Rate-Limit all
Mode Privileged Mode
10.3.11.13 show running-config

This command is used to display switch running config
Format show running-config
Mode Privileged Mode
10.3.11.14 show snmp
This command is used to display all snmp config
1) show* snmp *groups
This command display all snmp groups
Format show snmp groups
Mode Privileged Mode
2)show* snmp *users
This command display all snmp users
Format show snmp users
Mode Privileged Mode
3) show* snmp *communities
This command display all snmp communities
Format show snmp communities
Mode Privileged Mode
10.3.11.15 show sntp
This command is used to display switch sntp information
Format show sntp
Mode Privileged Mode
10.3.11.16 show spanning-tree
This command displays Spanning Tree information
1) show* spanning-tree *interface
This command displays RSTP ports information
show spanning-tree interface port
This command specify an switch interface
21
Format show spanning-tree interface port<*port-ID*>
Mode Privileged Mode
show spanning-tree interface all
This command display all switch interface
Format show spanning-tree interface all
Mode Privileged Mode
2) show* spanning-tree *mst
This command display MST information
show spanning-tree mst detailed
This command display a MST instance information
Format show spanning-tree mst detailed <*0..4094*>
Mode Privileged Mode
show spanning-tree mst instance
This command display ports information on a MST instance
Format show spanning-tree mst instance <*0..4094*>
Mode Privileged Mode
show spanning-tree mst summary
This command display all MST instance information
Format show spanning-tree mst summary
Mode Privileged Mode
show* spanning-tree *status
This command is used to display spanning-tree status
Format show Spanning-tree status
Mode Privileged Mode
10.3.11.17 show storm-control
This command is used to display storm-control information
Format show storm-control
Mode Privileged Mode

10.3.11.18 show sysinfo
This command is used to display system information including system up time
Format show sysinfo
Mode Privileged Mode
10.3.11.19 show switch
This command is used to display switch information
1) show switch admin-time
This command display the age time of web and console
Format show switch admin-time
Mode Privileged Mode
2) show switch age-time
This command display the age time of L2 table
Format show switch age-time
Mode Privileged Mode
3) show switch mac-table
This command is used to display address resolution protocol cache
22
Format show switch mac-table
Mode Privileged Mode
4) show switch mcast-table
This command display multicast address table
Format show switch mcast-table
Mode Privileged Mode
10.3.11.20 show trapflags
This command is used to display the value of trap flags that apply to the switch
Format show trapflags
Mode Privileged Mode
10.3.11.21 show vlan
This command is used to display vlan configuration
1)show vlan member
This command display vlan configuration
Format show vlan member <*1..4094*>
Mode Privileged Mode
2)show vlan number
This command display how many vlan has been created
Format show vlan number
Mode Privileged Mode
10.3.11.22 show rmon
1) Show rmon event
2) Show rmon event Index
This command displays rmon Event.
Format Show rmon event index <*1..65535*>
Mode Privileged Mode
3) Show rmon event
Format Show rmon event<CR>
Mode Privileged Mode
4) Show rmon Event log
This command displays rmon event log.
Format Show rmon Event log event index <1..65535>
Mode Privileged Mode
5) Show rmon alarm
Show rmon alarm index
This command displays rmon Alarm.
Format Show rmon alarm index <1..65535>
Mode Privileged Mode
Show rmon alarm

Format Show rmon alarm<CR>
Mode Privileged Mode
Show rmon event log
This command displays rmon event log.
Format Show rmon event log event index <1..65535>
Mode Privileged Mode
23
6) Show rmon history
This command displays rmon history.
Format Show rmon history index <1..65535>
Mode Privileged Mode
7)Show rmon statistics
This command displays port rmon statistics.
Format Show rmon statistics
Mode Privileged Mode
10.3.12 telnet
This command telnet the other host.
Format telnet <*A.B.C.D*>
Mode Privileged Mode

10.4 Global Config mode commands

10.4.1 exit
This command is used to exit current shell
Format exit
Mode Global Config
10.4.2 vlan
This command is used to configure vlan
10.4.2.1 vlan add
This command is used to create a new vlan
vlan add number
This command enter a vlan ID
Format vlan add number <*vlan-ID*>
Mode Global Config
vlan add range
This command enter a range of vlan ID
Format vlan add range from < *vlan-ID* > to <*vlan-ID*>
Mode Global Config
10.4.2.2 vlan delete
This command remove a existed vlan
Format vlan delete <*vlan-ID*>
Mode Global Config
10.4.2.3 vlan ingress
This command performs ingress vlan source port membership check
vlan ingress forward
The command is used to forward frame but don't learn SA into ARL table
Format vlan ingress forward
Mode Global Config
vlan ingress drop
24
This command is used to drop frames violation vid
Format vlan ingress drop
Mode Global Config
vlan ingress bypass

This command is used to forward frame and learn SA into ARL table
Format vlan ingress bypass
Mode Global Config
10.4.2.4 vlan port
This command is used to configure 802.1Q port parameters for vlans
1) vlan port all
This command is used to configure all ports
vlan port all port-configure
This command is used to configure ports in a specific vlan
Format vlan port all port configure <*vlan-ID*>
Mode Global Config
vlan port all protected
This command is used to configure protected ports
Format vlan port all protected {enable|disable}
Mode Global Config
vlan port all pvid
This command is used to configure port pvid
Format vlan port all pvid <*vlan-ID*>
Mode Global Config
2) vlan port ports
This command is used to configure multiple ports
vlan port ports port-configure
This command is used to configure ports in a specific vlan
Format vlan port ports port-configure <*vlan-ID*>
Mode Global Config
vlan port ports protected
This command is used to configure protected ports
Format vlan port ports protected {enable|disable}
Mode Global Config
vlan port ports pvid
This command is used to configure port vid
Format vlan port ports pvid < *vlan-ID*>
Mode Global Config
10.4.2.5 vlan lag
This command is used to configure lag to a special vlan
1) vlan lag vlan < vlan-id> exclude
25
This command is used to remove lag from a vlan
Format vlan lag vlan < *vlan-ID*> exclude lags <*lag-ID*>
Mode Global Config
2) vlan lag vlan <vlan-ID> untagged
This command is used to set to untagged lag.
Format vlan lag vlan <*vlan-ID*> untagged lags <*lag-ID*>
Mode Global Config
3) vlan lag vlan <vlan-ID> tagged
This command is used to set to tagged lag.
Format vlan lag vlan <*vlan-ID*> tagged lags <*lag-ID*>
Mode Global Config
10.4.3 Bridge
This command is used to configure switch aging time
Format bridge aging-time <0-1048575>
Mode Global Config
10.4.4 lacp-syspri
This command is used to configure lacp system priority
Format lacp-syspri system-priority <0-65535>
Mode Global Config

10.4.5 link-aggregation
This command is used to configure link aggregation
10.4.5.1 link-aggregation addport
This command is used to configure LAG groups
Format Link Aggregation addport lag <*LAG-ID*>
Mode Global Config
10.4.5.2 link aggregation delport
This command remove ports from LAG
1) Link Aggregation delport all
This command remove all ports from a LAG
Format link-aggregation-delport all lag <*LAG-ID*>
Mode Global Config
2) link aggregation delport lag
This command remove specify LAG group
Format link aggregation delport lag <*LAG-ID*>
Mode Global Config
10.4.6 LLDP
10.4.6.1 lldp enable
This command is used to enable lldp functions
Format lldp enable
Mode Global Config
26
10.4.6.2 lldp disable
This command is used to disable lldp functions
Format lldp disable
Mode Global Config
10.4.6.3 lldp adv-interval
This command is used to specify advertised interval in seconds
Format lldp adv-interval <5-32768>
Mode Global Config
10.4.6.4 lldp fast-startcnt
This command is used to specify advertised interval in seconds
Format lldp fast-startcnt <*1-10*>
Mode Global Config
10.4.6.5 lldp hold
This command is used to specify hold value
Format lldp hold <*2-10*>
Mode Global Config
10.4.6.6 lldp notify-interval
This command is used to specify notification interval in seconds
Format lldp notify-interval <5-3600>
Mode Global Config
10.4.6.7 lldp reinit-delay
This command is used to specify re-initialization delay in seconds
Format lldp reinit-delay <1-10>
Mode Global Config
10.4.6.8 lldp tx-delay
Transmit Delay in seconds
Format lldp tx-delay <1-8192>
Mode Global Config
10.4.6.9 lldp mgmt-addrtxport
A range of ports can be set.
Format lldp mgmt-addrtxport ports <port list>
Mode Global Config
e.g. switch(config)# lldp mgmt-addrtxport ports 1
switch(config)# lldp mgmt-addrtxport ports 1-4

10.4.7 Log
This command is used to configure log server
10.4.7.1 Log log-server
This command is used to configure log server
1) Log log-server name <WORD>add
This command is used to specify log server name, enter a name, up to 12 characters, add a log server IP address
Format Log log-server name <*WORD*> add ipaddr word
Mode Global Config
2) Log log-server name <word> delete
This command is used to delete a log server
27
Format log log-server name <*WORD*> delete
Mode Global Config
10.4.7.2 Log logging-target
This command is used to configure log notification level
1) log logging-target memory
This command is used to specify memory log notify-level
Format log logging-target memory {enable|disable}
Mode Global Config
2) log logging-target flash
This command is used to specify flash log notify-level
Format log logging-target flash {enable|disable}
Mode Privileged Mode
3) log logging-target console
This command is used to specify console log notify-level
Format log logging-target console {enable|disable}
Mode Global Config
4) log logging-target server
This command is used to specify console log notify-level
Format log logging-target server name <*WORD*> {enable|disable}
Mode Global Config
10.4.8 radius-server
This command is used to configure radius server
Format radius-server ip <*IP addr*>
Mode Global Config
10.4.9 static-address
This command is used to specify static address
10.4.10.1 static-address add
This command is used to add static mac address
Format static-address add <*mac addr*> vid <*vlan-ID*> port <*port-ID*>
Mode Global Config
10.4.10.2 static-address delete
This command is used to delete static mac address
Format static-address delete <mac *addr*> vid <vlan-*ID*>
Mode Global Config
10.4.10 mgmt-accesslist commands
10.4.10.1 mgmt-accesslist ipaddr
This command specifies a management access IP for the DUT, up to 8 IP address can be set.
Format mgmt-accesslist ipaddr <*IP addr*>
Mode Global Config
10.4.10.2 mgmt-accesslist enable
This command enables management access list. Only the IP address specified in the management list is allowed to access DUT.
Format mgmt-accesslist enable

Mode Global Config
28
10.4.10.3 mgmt-accesslist disable
This command disables management access list.
Format mgmt-accesslist disable
Mode Global Config
10.4.11 monitor commands
10.4.11.1 monitor enable
This command enables port mirroring.
Format monitor enable
Mode Global Config
10.4.11.2 monitor disable
This command disables port mirroring.
Format monitor disable
Mode Global Config
10.4.11.3 monitor des
Configure destination port.
1) monitor des <port-ID> probetype bidirection
This command configures port monitor probetype as bi-direction traffic.
Format monitor des <*port-ID*> probetype bidirection src <*port list*>
Mode Global Config
e.g. Switch(config)# monitor des 1 probetype bidirection src 2-8
2) monitor des <port-ID> probetype ingress
This command configures port monitor probetype as ingress traffic.
Format monitor des <*port-ID*> probetype ingress src <*port list*>
Mode Global Config
e.g. Switch(config)# monitor des 1 probetype ingress src 2-8
3) monitor des <port-ID> probetype egress
This command configures port monitor probetype as egress traffic.
Format monitor des <*port-ID*> probetype egress src <*port list*>
Mode Global Config
e.g. Switch(config)# monitor des 1 probetype egress src 2-8
10.4.12 dot1x commands
10.4.12.1 dot1x enable
This command enables global 802.1x function.
Format dot1x enable
Mode Global Config
10.4.12.2 dot1x disable
This command disables global 802.1x function.
Format dot1x disable
Mode Global Config
10.4.12.3 dot1x port-control
Configure port auto-authentication mode.
1) dot1x port-control enable
This command set auto-authorized on a list of ports.
Format dot1x port-control enable port <*port list*>
Mode Global Config
2) dot1x port-control disable
This command set force authorized on a list of ports.
Format dot1x port-control disable port <*port list*>
Mode Global Config
29
e.g. Switch(config)# dot1x port-control disable port 1-4
10.4.13 network commands
10.4.13.1 network mgmt-vlan
This command changes management vlan.

Format network mgmt-vlan <*vlan-ID*>
Mode Global Config
10.4.13.2 network parms
This command configures static IP address of the switch.
Format network parms <*IP addr*> <*subnet mask*> <*gateway*>
Mode Global Config
10.4.19 network protocol
This command configure switch dhcp client.
Format network protocol {dhcp|none}
Mode Global Config
10.4.13.4 network dhcp-relay
Configure switch dhcp relay functions.
1) network dhcp-relay mode
This command configures dhcp relay mode.
Format network dhcp-relay mode {enable|disable}
Mode Global Config
2) network dhcp-relay server
This command configures dhcp-relay server ip-address.
Format network dhcp-relay server <*A.B.C.D*>
Mode Global Config
3) network dhcp-relay vlan
Configure dhcp-relay option-82 vlan information.
network dhcp-relay vlan <vlan-ID> add
This command enters a vlan which will be enable DHCP-relay option82.
Format network dhcp-relay vlan <*vlan-ID*> add
Mode Global Config
network dhcp-relay vlan <vlan-ID> remove
This command enters a vlan which will be disable dhcp-relay option82.
Format network dhcp-relay vlan <*vlan-ID*> remove
Mode Global Config
10.4.13.5 network sysinfo
Configure switch system information.
Network sysinfo sysname
This command configures system name.
Format network sysinfo sysname <*WORD*>
Mode Global Config
network sysinfo syslocate
This command configures system location.
Format network sysinfo syslocate <*WORD*>
Mode Global Config
30
network sysinfo syscontact
This command configures system contact information.
Format network sysinfo syscontact <*WORD*>
Mode Global Config
10.4.13.6 network admin-timeout
This command configures web/console admin time out interval.
‘0’ means disable.
Format network admin-timeout <*0-65535*>
Mode Global Config
10.4.14 port-all commands
10.4.14.1 port-all admin-mode
This command configures ports admin mode.
Format port-all admin-mode {enable | disable}
Mode Global Config
10.4.14.2 port-all auto-negotiate

This command configures ports auto-negotiation mode.
Format port-all auto-negotiate {enable|disable}
Mode Global Config
10.4.14.3 port-all flow-control
This command configures ports flow control.
Format port-all flow-control {enable|disable}
Mode Global Config
10.4.14.4 port-all portsec-lockmode
Configure port security.
1) port-all portsec-lockmode none
This command disable port security.
Format port-all portsec-lockmode none
Mode Global Config
2) port-all portsec-lockmode static
Note: This commands only support on G24-PORTS 100BASETX + 2 GIGABIT COMBO PORTS LAYER 2 MANAGEMENT SWITCHL/ G48 100BASETX + 4 GIGABIT COMBO WITH 2 SHARED MINI-GBIC SLOTS LAYER 2+ MANAGEMENT SWITCH.
This command enable static lock mode.
Format port-all portsec-lockmode static
Mode Global Config
3) port-all portsec-lockmode dynamic
This command enable limited dynamic lock mode.
Format port-all portsec-lockmode dynamic max-entries <0-24>
Mode Global Config
10.4.14.5 port-all rate-limit
Configure rate limit value on all ports.
1)port-all rate-limit egress
This command specifies egress rate limit.
Format port-all Rate-Limit egress <*value*>
Mode Global Config
31
2)port-all rate-limit ingress
This command specifies ingress rate limit.
Format port-all rate-limit ingress <*value*>
Mode Global Config
10.4.14.6 port-all rmon-counter
This command configures rmon counter capability on ports.
Format port-all rmon-counter {enable|disable}
Mode Global Config
10.4.14.7 port-all speed
This command configures ports speed.
Format port-all speed {10hd|10fd|100hd|100fd}
Mode Global Config
10.4.14.8 port-all storm-control
Configure all ports' storm control settings.
1) port-all storm-control disable
This command disables storm control.
Format port-all Storm-Control disable
Mode Global Config
2) port-all storm-control broadcast
This command configures storm control for broadcast only.
Format port-all storm-control broadcast <*value*>
Mode Global Config
3) port-all storm-control broadcast-multicast
This command configures storm control for broadcast and multicast.

Format port-all Storm-Control broadcast-multicast <*value*>
Mode Global Config
4) port-all storm-control broadcast-unknown
This command configures storm control for broadcast and unknown unicast.
Format port-all storm-control broadcast-unknown <*value*>
Mode Global Config
5) port-all storm-control all-cast
This command configures storm control for broadcast, multicast and unknown unicast.
Format port-all Storm-Control all-cast <*value*>
Mode Global Config
10.4.15 qos commands
10.4.15.1 qos qos-advanced
Configure qos advanced mode.
1) qos qos-advanced DSCP
This command enables DSCP mode.
Format qos qos-advanced DSCP
Mode Global Config
2) qos qos-advanced ip_precedence
This command enables IP Precedence mode.
Format qos qos-advanced ip_precedence
Mode Global Config
3) qos qos-advanced none
This command disables qos advanced mode.
Format qos qos-advanced none
Mode Global Config
32
10.4.15.2 qos cos
This command configures 802.1p priority queue mapping.
Format Qos cos priority <0-7> queue <1-4>
Mode Global Config
10.4.15.3 qos dscp
This command specifies dscp value to queue mapping.
Format Qos dscp <0-63> queue <1-4>
Mode Global Config
10.4.15.4 qos port-based
This command configures port-based priority mapping.
Format qos port-based port <*WORD*>status {enable | disable}
Mode Global Config
10.4.15.5 qos scheduling
Configure qos scheduling mode.
1) qos scheduling strict
This command sets to strict priority.
Format qos scheduling strict
Mode Global Config
2) qos scheduling wrr
This command sets to Weight Round-Robin.
Format qos scheduling wrr
Mode Global Config
10.4.15.6 qos ip-precedence
This command configures IP precedence queue mapping.
Format qos ip-precedence <0-7> queue <1-4>
Mode Global Config
10.4.15.7 qos wrr
This command configures queue weight for weight round robin.
Format qos wrr weight <1-15> queue <1-4>

Mode Global Config
10.4.16 set commands
10.4.16.1 set IGMP
Configure IGMP snooping.
1) set igmp enable
This command enables igmp snooping.
Format set igmp enable
Mode Global Config
2) set igmp disable
This command disables IGMP snooping.
Format set igmp disable
Mode Global Config
3) set igmp last-memberquery
This command specifies last member query interval.
Format set igmp last-memberquery <1-200>
33
Mode Global Config
4) set igmp last-membercount
This command specifies last member count.
Format set igmp last-membercount <1-20>
Mode Global Config
5) set igmp query-interval
This command specifies igmp query interval<secs>.
Format set igmp query-interval <10-600>
Mode Global Config
6) set igmp query-resinterval
This command specifies igmp query response interval<secs>.
Format set igmp query-resinterval <0-200>
Mode Global Config
7) set igmp robustness
This command specifies robustness variable.
Format set igmp robustness <1-20>
Mode Global Config
8) set igmp router-port
This command specifies igmp router port.
Format set igmp router-port ports <*port list*>
Mode Global Config
e.g. Switch(config)# set igmp router-port ports 1-10
10.4.16.2 set igmp-querier
This command configures igmp querier.
Format set igmp-querier {enable | disable}
Mode Global Config
10.4.16.3 set igmp-proxy
This command configures igmp proxy.
Format set igmp-proxy {enable | disable}
Mode Global Config
10.4.16.4 set static-mcast
Configure static multicast.
1) set static-mcast name <WORD> add
This command create a multicast group.
Format set static-mcast name <*WORD*> add vid <*vlan-ID*> mac <*mac-addr*>member port <*port list*>
Mode Global Config
2) set static-mcast name <WORD>delete
This command delete a static multicast group.
Format set static-mcast name <*WORD*>delete

Mode Global Config

10.4.17 snmp commands

10.4.17.1 snmp notify

This command configures snmp notification.

Format snmp notify {enable|disable}

Mode Global Config

34

10.4.17.2 snmp group

1) snmp group add

This command create a snmp group.

Format snmp group add <*WORD*>version <1-2>

Mode Global Config

2) snmp group delete

This command delete a snmp group.

Format snmp group delete <*WORD*>

Mode Global Config

10.4.17.3 snmp user

1)* snmp *user add

This command creates a snmp user.

Format snmp user add <*user name*> group <*group name*> version <*1-3*>

Mode Global Config

2)* snmp *user delete

This command deletes a snmp user.

Format snmp user delete <*WORD*>

Mode Global Config

10.4.17.4 snmp community

1)* snmp *community add

This command creates a community.

Format snmp community add <*community name*> group <g*roup name*> mgmt-ip <*ip-addr*>

Mode Global Config

2)* snmp *community delete

This command deletes a community.

Format snmp community delete <*community name*>.

Mode Global Config

10.4.17.5 snmp trapstation

1)* snmp *trapstation add

Create a snmp trap station.

snmp trapstation add <ip-addr> community <community name> type bootup

Send trap when system reboot

Format snmp trapstation add <*ip-addr*> community <*community name*> type bootup trap-version {1|2}

Mode Global Config

snmp trapstation add <ip-addr> community <community name> type linkchange

Send trap when port link change.

Format snmp trapstation add <i*p-addr*> community <*community name*> type linkchange trap-version {1|2}

Mode Global Config

snmp trapstation add <ip-addr> community <community name> type both

35

Send trap when system reboot or port link change.

Format snmp trapstation add <*ip-addr*> community <*community name*> type both trap-version {1-2}

Mode Global Config
snmp trapstation add <ip-addr> community <community name> type none
Send no trap.
Format snmp trapstation add <*ip-addr*> community <*community name*> type none trap-version {1-2}
Mode Global Config
2)* snmp *trapstation delete
This command delete a trap station.
Format snmp trapstation delete <*WORD*>
Mode Global Config
10.4.18 sntp commands
10.4.18.1 sntp daylight
This command enables or disables the daylight saving configuration.
Format sntp daylight {enable|disable}
Mode Global Config
10.4.18.2 sntp localtime
Configure the local time.
1)* sntp *localtime enable
This command enables local time.
Format sntp localtime enable
Mode Global Config
2)* sntp *localtime localtime_date
This command sets local time.
Format sntp localtime localtime_date <*year*> <*month*> <*date*> <*hour*> <*minute*> <*second*>
Mode Global Config
10.4.18.3 sntp server
1)* sntp *server enable
This command enables sntp server.
Format sntp server enable
Mode Global Config
2)* sntp *server ipaddr
This command sets sntp server IP address.
Format sntp server ipaddr <*IP-addr*>
Mode Global Config
3)* sntp *server polling
This command sets sntp server polling time interval.
Format sntp serve polling <*0-9*>
Mode Global Config
10.4.18.4 sntp timezone
This command sets sntp timezone.
Format sntp timezone <1-75>
Mode Global Config
10.4.19 spanning-tree commands
36
10.4.110.1 spanning-tree forceversion
This command configures Spanning Tree protocol version.
1)* spanning-tree *forceversion 8021s
This command selects spanning tree type as 8021.s(multiple Spanning Tree).
Format spanning-tree forceversion 8021s
Mode Global Config
2) spanning-tree forceversion 8021w
This command selects spanning tree type as 802.1w(rapid Spanning Tree).
Format spanning-tree forceversion 8021w
Mode Global Config

3) spanning-tree forceversion none
This command selects none spanning tree type.
Format spanning-tree forceversion none
Mode Global Config
10.4.110.2 spanning-tree configuration
This command configures MSTP region name and revision.
1) spanning-tree configuration name
This command configures MSTP region name (Max.32 chars).
Format spanning-tree configuration name <*WORD*>
Mode Global Config
2) spanning-tree configuration revision
This command configures revision level.
Format spanning-trees configuration revision <0-65535>
Mode Global Config
10.4.110.3 spanning-tree forward-time
This configures the bridge forward delay parameter.
Format spanning-tree forward-time <4-30>
Mode Global Config
10.4.110.4 spanning-tree max-age
This command configures the bridge max age parameter.
Format spanning-tree max-age <6-40>
Mode Global Config
10.4.110.5 spanning-tree max-hops
This command configure the number of hops in a region.
Format spanning-tree max-hops <1-40>
Mode Global Config
10.4.110.6 spanning-tree port
1)spanning-tree port all
This command specifies RSTP capability for all ports.
Format spanning-tree port all {enable |disable}
Mode Global Config
2)spanning-tree port cost
This command configures RSTP port path cost.
Format spanning-tree port cost <0-200000000>
Mode Global Config
3)spanning-tree port priority
37
This command configures RSTP port priority.
Format spanning-tree port priority <0-24>
Mode Global Config
4)spanning-tree port edge
This command configures STP edge .
Format spanning-tree port edge {enable|disable}
Mode Global Config
5)spanning-tree port force-p2plink
This command configures force point to point link mode on ports.
Format spanning-tree port force-p2plink {auto|enable|disable}
Mode Global Config
6)spanning-tree port migration-check
This command Re-checks the appropriate BPDU format to send on ports.
Format spanning-tree port migration-check {enable|disable}
Mode Global Config
10.4.110.7 spanning-tree priority
This command configures RSTP bridge priority value.
Format spanning-tree priority <0-61440>
Mode Global Config

10.4.110.8 spanning-tree mst
Configure a multiple spanning tree instance.
1) spanning-tree mst instance
This command creates or removes a MST instance
spanning-tree mst instance add
This command creates a MST instance.
Format spanning-tree mst instance add vlan <*vlan list*> mstpid <*MST ID*>
Mode Global Config
e.g. Switch(Config)# Spanning-Tree mst instance add vlan 2-5 mstpid 2
Switch(Config)# Spanning-Tree mst instance add vlan 6 mstpid 3
spanning-tree mst instance delete
This command removes the last MST instance.
Format spanning-tree mst instance delete
Mode Global Config
2)spanning-tree mst vlan
This command adds or deletes vlan frome a MSTP instance.
spanning-tree mst vlan <MST ID> <vlan list> add
This command creates a MST instance.
Format spanning-tree mst vlan <*MST ID*> <*vlan list*> add
Mode Global Config
e.g. Switch(Config)# Spanning-Tree mst vlan 3 3-5 add
Spanning-Tree mst vlan <MST ID> <vlan list> delete
This command deletes a vlan from a MST instance.
Format Spanning-Tree mst vlan <*MST ID*> < vlan *list*> delete
Mode Global Config
38
3) spanning-tree mst bridgepri
This command configures bridge priority for a MST instance.
Format spanning-tree mst bridgepri <*MST ID*> <*priority*>
Mode Global Config
4) spanning-tree mst cost
This command configures port path cost in a MST instance.
Format spanning-tree mst cost <*MST ID*> <*path cost*> ports <*port list*>
Mode Global Config
5)spanning-tree mst priority
This command configures port priority in a MST instance
Format spanning-tree mst priority <*MST ID*> <*priority*> ports <*port list*>
Mode Global Config
10.4.20 User commands
This command changes user password.
Format user password
Mode Global Config
10.4.21 Interface commands
This command enters into configure interface mode.
Format Interface <*port-ID*>
Mode Global Config
10.4.22 rmon
This command is used to configure RMON.
10.4.22.1 rmon event
This command creates rmon event entry.
Format rmon event index < *1..65535* > desc <*WORD*> event <*1..4*>
community <*WORD*>owner<*WORD*>
Mode Global Config
e.g. Switch(Config)# rmon event index 1 desc 123 event 4 community 123
owner test
10.4.22.2 rmon alarm

This command creates rmon alarm entry.
Format rmon alarm index < 1..65535 >interval<0..3600>interface<port number>counter<1..17>sample{absolute|delta}start{rasing|falling|all}rthreshold<0..65535>fthreshold<*0..65535*> reindex <*0..65535*> feindex<*0..65535*> owner< *WORD*>
Mode Global Config
e.g. Switch(Config)# RMON alarm index 1 interval 10 interface counter 1 sample delta start all rthreshold 100 fthreshold 10 reindex 1 feindex 0 owner test

10.4.22.3 rmon del

1) rmon del event

This command deletes rmon event entry.
Format rmon del event index< 1..65535 >
39
Mode Global Config

2) rmon del alarm

This command deletes rmon alarm entry.
Format rmon del alarm index< 1..65535 >
Mode Global Config

10.4.23 access list commands

Note: This commands only support on G24-PORTS 100BASETX + 2 GIGABIT COMBO PORTS LAYER 2+ MANAGEMENT SWITCH/G24 GIGABIT PORTS WITH 2 SHARED MINI-GBIC SLOTS/G44 GIGABIT PORTS WITH 4 SHARED MINI-GBIC SLOTS L2 MANAGEMENT SWITCH/G48 100BASETX + 4 GIGABIT COMBO WITH 2 SHARED MINI-GBIC SLOTS LAYER 2+ MANAGEMENT SWITCH.

10.4.23.1 access-list name <WORD> add

This command creates a new access-list.
Format access-list name <*WORD*> add priority <1-65535>
Mode Global Config

10.4.23.2 access-list name <WORD> action

1) access-list name <WORD> action deny

This command denies an ACL entry.
Format access-list name <*WORD*> action deny
Mode Global Config

2) access-list name <WORD> action permit

This command permits an ACL entry and queue 1-4 will assign priority queue when rule activated.
Format access-list name <*WORD*> action permit {<cr>|queue <1-4>}
Mode Global Config

10.4.29 access-list name <WORD> clear

This command clears ACL entry contents.

1) access-list name <WORD> clears SRC IP

This command clears the source IP/subnet mask filter.
Format access-list name <*WORD*> clear SRC IP
Mode Global Config

2) access-list name <WORD> clears DST IP

This command clears the destination IP/subnet mask filter.
Format access-list name <*WORD*> clear DST IP
Mode Global Config

3) access-list name <WORD> clear L4port

access-list name <WORD> clear L4port SRC port

This command clears TCP/UDP source port filter.
Format access-list name <*WORD*> clear l4port SRC port
Mode Global Config

access-list name <WORD> clear l4port DST port

This command clears TCP/UDP destination port filter.
Format access-list name <*WORD*> clear l4port DST port
40
Mode Global Config
4) access-list name <WORD> clear packet-type
This command clears packet type filter.
Format access-list name <*WORD*> clear packet-type
Mode Global Config
5) access-list name <WORD> clear mac SA
This command clears a source mac address.
Format Access-list name <*WORD*> clear mac SA
Mode Global Config
6) access-list name <WORD> clear MAC DA
This command clears a destination mac address.
Format Access-list name <*WORD*> clear mac DA.
Mode Global Config
7)access-list name <WORD> clear VID
This command clears the 802.1Q VLAN tag of packet.
Format Access-list name <*WORD*> clear VID
Mode Global Config
8)access-list name <WORD> clear ether-type
This command clears ether type filter.
Format access-list name <*WORD*> clear ether-type
Mode Global Config
10.4.23.4 access-list name <WORD> deletes.
This command removes the ACL entry.
Format access-list name <*WORD*> deletes
Mode Global Config
10.4.23.5 access-list name <WORD> {enable|disable}
This command enables/disables the ACL entry.
Format access-list name <*WORD*> {enable|disable}
Mode Global Config
10.4.23.6 access-list name <WORD> set
1) access-list name <WORD> set priority
This command specifies ACL entry priority.
Format access-list name <*WORD*> set priority <0-65535>
Mode Global Config
2) access-list name <WORD> set IP-mode
access-list name <WORD> set IP-mode SRC IP.
This command specifies a source IP address.
Format access-list name <*WORD*> set IP-mode SRC IP <IP-addr>
<*mask-addr*>
Mode Global Config
access-list name <WORD> set IP-mode DST IP
This command specifies a destination IP address.
41
Format access-list name <*WORD*> set IP-mode DSP IP <*IP-addr*>
<*mask-addr*>
Mode Global Config
***3)* access-list name <WORD> set L4port**
This command specifies the TCP/UDP port range.
access-list name <WORD> set l4port SRC-port
This command specifies the source TCP/UDP port range.
Format Access-list name <*WORD*> set L4 port SRE-port from <1-65535>
to <1-65535>
Mode Global Config

access-list name <WORD> set l4port DST-port
This command specifies the destination TCP/UDP port range.
Format access-list name <*WORD*> set l4port DST-port from <1-65535> to <1-65535>
Mode Global Config
4) access-list name <WORD> set IP-mode packet-type
This command specifies the packet type.
Format access-list name <*WORD*> set IP-mode packet-type {ICMP|IGMP|IP|TCP|UDP|GRE}
Mode Global Config
5) access-list name <WORD> set mac-mode
Specify ACL entry priority.
access-list name <WORD> set mac-mode mac SA
This command specifies a source mac address.
Format Access-list name <*WORD*> set mac-mode mac SA <mac-addr> <mask-addr>
Mode Global Config
access-list name <WORD> set mac-mode mac DA
This command specifies a destination mac address.
Format access-list name <*WORD*> set mac-mode mac DA <*mac-addr*> <*mask-addr*>
Mode Global Config
access-list name <WORD> set mac-mode ether-type
This command specifies the ether type of the packet.
Format access-list name <*WORD*> set mac-mode ether-type {ipv4|ARP|xns}
Mode Global Config
10.4.24 arp Commands
Note: This commands only support on GG24 GIGABIT PORTS WITH 2 SHARED MINI-GBIC SLOTS/G44 GIGABIT PORTS WITH 4 SHARED MINI-GBIC SLOTS L2 MANAGEMENT SWITCH)
10.4.24.1 arp dynamic
1) arp dynamic enables and disables.
This command enables and disables dynamic arp functions.
Format arp dynamic {enable|disable}
Mode Global Config
2) arp dynamic aging-time
This command set arp dynamic aging-time between 0s and 999s.”0”means 42
disable.
Format arp dynamic aging-time <0~999>
Mode Global Config
3) arp dynamic ports
This command set dynamic arp ports to trust and un-trust.
Format arp dynamic ports {trust|untrust} <port-list>
Mode Global Config
e.g. Swtich<Config># arp dynamic ports trust 1-4
Swtich<Config># arp dynamic ports untrust 4
4) arp dynamic vlan
This Command set add/remove dynamic arp on specified vlan.
Format arp dynamic vlan {add|remove} from < vlan -id> to < vlan -id>
Mode Global Config
e.g. Swtich<Config># arp dynamic vlan add from 1 to 1
Swtich<Config># arp dynamic vlan remove from 1 to 1
10.4.24.2 *arp* static command
This command set arp static address table for mac address with IP Address.

Format arp static {add|delete} vid <1~4094> ip <A.B.C.D> mac <mac-address>
Mode Global Config

10.4.25 dos Commands

Note: This commands only support on GG24 GIGABIT PORTS WITH 2 SHARED MINI-GBIC SLOTS/G44 GIGABIT PORTS WITH 4 SHARED MINI-GBIC SLOTS L2 MANAGEMENT SWITCH/G48 100BASETX + 4 GIGABIT COMBO WITH 2 SHARED MINI-GBIC SLOTS LAYER 2+ MANAGEMENT SWITCH)

10.4.25.1 dos land

This Command enables and disables land-type attacks prevention.
Format dos land {enable|disable}
Mode Global Config

10.4.25.2 dos Blat

This Command enables and disables blat-type attack prevention.
Format dos blat {enable|disable}
Mode Global Config

10.4.25.3 dos SYN-fin

This Command enables and disables SYN-fin-type attack prevention.
Format dos syn -fin {enable|disable}
Mode Global Config

10.4.25.4 dos ports

1) dos ports Smurf

This command enables and disables Smurf-TYPR attack prevention.
Format dos ports smurf {enable|disable}
Mode Global Config
43

2)dos ports ping-flooding

This command enables and disables ping-flooding-type attack prevention.
Format dos ports ping-flooding {enable|disable}
Mode Global Config

3)dos ports SYNACK-flooding

This command enables and disables SYNACK -flooding -type attack prevention. Set rate is 64 kbps or 128kbps for port lists (1, 3-5, 7-10.11)
Format dos ports synack -flooding {enable|disable} rate {64|128} <port-list>
Mode Global Config
e.g. Switch<Config>#dos ports synack -flooding enablerate 64 1-4
Switch<Config>#dos ports synack -flooding enablerate 64 5

10.5 Interface Config mode commands

10.5.1 exit command

Exit current shell
Format exit
Mode Interface Config

10.5.2 dot1x command

Set 802.1x port control.

10.5.2.1 Set auto-authorized on ports

Format 802.1x port-control {enable|disable}
Mode Interface Config

10.5.3 Configure port lacp mode

10.5.3.1 admin command

Configure admin key of port
Format lacp admin <0 ..65535>
Mode Interface Config

e.g. switch(interface g1)#lacp admin 36768

10.5.3.2 priority command

Configure lacp port priority

Format lacp priority <0..65535>

Mode Interface Config

10.5.4 addport command

add one port to a LAG group

Format addport <*LAG-ID*>

Mode Interface Config

10.5.5 delport command

Remove a port from a LAG group

Format delport <*LAG-ID*>

Mode Interface Config

10.5.6 lldp command

An lldp agent can transmit information about the capabilities and current status of the system associated with its MSAP identifier. The lldp agent can also receive information about the capabilities and current status of the system

associated with a remote MSAP identifier. However, lldp agents are not provided any means of soliciting information from other lldp agents via this protocol.

10.5.6.1 lldp state set

lldp status

Only transmit the lldp status

Format lldp state {tx|rx| tx_rx|disable}

Mode Interface Config

10.5.6.2 configure notifications

Enable/disable notification form the agent

Format lldp notification {enable|disable}

Mode Interface Config

10.5.6.3 Configure med notifications

Configure wether or not MED notifications from the agent are enabled.

Enable/disable med notification form the agent

Format lldp med-notification {enable|disable}

Mode Interface Config

e.g. Switch(Interface 1)#lldp med-notification enable

10.5.6.4 Configures which TLVs are enabled for transmission.

1) basic set

Format lldp tlvs-tx {enable|disable} option basic {port-desc|sys-name|sys-desc|sys-capa|sys-capa }

Mode Interface Config

2) 8021 set

Status of local-802.1 settings

Format lldp tlvs-tx {enable|disable} option 8021 {pvid| vlanname| protocol-id}

Mode Interface Config

eg.switch(interdface 1)lldp tlvs enable option 8021 pvid

3) 8023 set

Format lldp tlvs-tx {enable|disable} option 8023 {mac-phy| power| link-aggregation| frame-size}

Mode Interface Config

4) MED-set

Status of MED Settings

Format lldp tlvs-tx {enable|disable} option med-set {capabilites| net-policy| location-id| mdi}

Mode Interface Config
10.5.7 admin-mode
Configure administrative mode on a port
Format Switch(Interface 1)# admin-mode {enable|disable}
Mode Interface Config
10.5.8 auto-negotiate
45
Configure auto-negotiate mode on a port
Format auto-negotiate {enable|disable}
Mode Interface Config
10.5.9 speed
Set port speed to 10Mbps half duplex/ 10Mbps full/ 100Mbps half/ 100Mbps full/ 1000Mbps 100FX mode/1000base-x full .
Format speed {10hd|10fd|100hd|100fd|1000fd|100fx|1000base-x}
Mode Interface Config
10.5.10 flow-control command
flow-control enable
This command enable flow-control at port.
Format flow-control {enabledisable}
Mode Interface Config
10.5.11 port-security command
1)port-security
This command add or delete a static mac into mac security table.
Format port-security {add|delete} <*sourcemac* >
Mode Interface Config
2)port-security lock-mode
This command enable/disable port security.
Format port-security lock-mode {none|static}
Mode Interface Config
port-security lock-mode dynamic
This command enable limited dynamic lock mode,and specify maximin learning entries for limited dynamic lock mode.the max-entries value :0~25.
Format port-security lock-mode dynamic max-entries 24
Mode Interface Config
10.5.12 qos command
This command specifies port-based qos.
Format qos port-based status {enable|disable}
Mode Interface Config
10.5.13 rate-limit command
10.5.13.1 rate-limit Egress
This command limits egress rate, which the unit is Kbps.
Format rate-limit egress <*rate*>
Mode Interface Config
10.5.13.2 rate-limit Ingress
This command limits ingress rate, which the unit is Kbps.
Format rate-limit ingress <*rate*>
Mode Interface Config
10.5.14 storm-control command
10.5.14.1 storm-control
Enable/disable storm control.
Format storm-control disable
Mode Interface Config
46
10.5.14.2 storm-control broadcast
This command storm control for broadcast only, and limited value :0,64,256,1024,10240,65536.102400,1024000,which the unit is Kbps

and 0 means no limit.
Format storm-control broadcast <*rate*>
Mode Interface Config
10.5.14.3 storm-control broadcast-multicast
This command storm control limited
value :0,64,256,1024,10240,65536.102400,1024000,which the unit is Kbps
and 0 means no limit.
Format storm-control broadcast-multicast <*rate*>
Mode Interface Config
10.5.14.4 storm-control broadcast-unknown
This command storm control limited
value :0,64,256,1024,10240,65536.102400,1024000,which the unit is Kbps
and 0 means no limit.
Format storm-control broadcast-unknown <*rate*>
Mode Interface Config
e.g. Switch(Interface 1)# storm-control broadcast-unknown 64
10.5.14.5 storm-control all-cast
This command storm control limited
value :0,64,256,1024,10240,65536.102400,1024000,which the unit is Kbps
and 0 means no limit.
Format storm-control all-cast <*rate*>
Mode Interface Config
10.5.15 rmon-counter command
This command specifies rmon counter capability on a port
Format rmon-counter {enable|disable}
Mode Interface Config
10.5.16 set igmp-router-port command
This command specifies igmp router port .
Format set igmp-router-port {ebable|disable}
Mode Interface Config
10.5.17 spanning-tree command
10.5.17.1 spanning-tree cost
This command configure RSTP port path cost, path cost value:0~200000000.
Format spanning-tree cost <*pathcost*>
Mode Interface Config
10.5.17.2 spanning-tree edge
This command configure edge property
Format spanning-tree edge {enable|disable}
Mode Interface Config
e.g. Switch(Interface 1)# spanning-tree edge enable
47
10.5.17.3 spanning-tree force-p2plink
This command configure force point to point link mode.
Format spanning-tree force-p2plink {auto|enable|disable}
Mode Interface Config
10.5.17.4 spanning-tree migration-check
This command re-checks the appropriate BPDU format to send on this port
Format spanning-tree migration-check {enable|disable}
Mode Interface Config
10.5.17.5 spanning-tree mst
This command configures multiple spanning tree instance.
1) spanning-tree mst cost
This command configure the path cost on a MST instance :1~200000000.
Format spanning-tree mst cost <*pathcost*>
Mode Interface Config
2) spanning-tree mst priority

This command configure the port priority on a MST instance:0~4096.
Format spanning-tree mst priority <1 4096>
Mode Interface Config
10.5.17.6 spanning-tree participation
This command configures RSTP capability on a port.
Format spanning-tree participation {enable|disable}
Mode Interface Config
10.5.17.7 spanning-tree priority
this command configure RSTP port priority:0~240
format spanning-tree priority <0..240>
mode Interface Config
10.5.18 VLAN command
10.5.18.1 vlan participation
This command join or leave a vlan.
1)vlan participation exclude
This command leave a vlan.
Format vlan participation exclude < *vlan id*>
Mode Interface Config
2) vlan participation
This command join a vlan with untagged/tagged mode.
Format vlan participation {untagged |tagged}< vlan id>
Mode Interface Config
10.5.18.2 vlan protected
This command configuresport protected property.
Format vlan protected {enable|disable}
Mode Interface Config
10.5.18.3 vlan dropnq
This command configure port drop no 8021q frame .
Format vlan dropnq {enable|disable}

Appendix A: Basic Troubleshooting

In the unlikely event that the switch does not operate properly, follow the troubleshooting tips below. If more help is needed, contact Asante's technical support at www.asante.com/support.

Problem	Possible Solutions
The Power LED is not lit.	Check the power connection. Plug the power cord into another known working AC outlet. The primary power supply has failed. Install the optional external power supply and have the primary power supply serviced as soon as possible.
The 10/100/1000 port Link LEDs are not lit.	Check the cable connections. Make sure the connectors are seated correctly in each port, and that the correct type of cable is used in each port. See *Chapter 2.6: Connecting to the Network* for more information.
The GBIC Link LED is not lit.	Check the GBIC connector. Make sure the cables are inserted correctly, with the Transmit (Tx) connector on one side of the link connected to the Receive (Rx) connector on the other side of the link.
Cannot establish communication to another device (switch, router, workstation, etc.).	• Make sure the Link LED for the port in use is on. Make sure the correct cable type is used. See *Chapter 2.6 Connecting to the Network* for more information on cabling procedures • Make sure the IP address, subnet mask, and VLAN membership of the switch are correct • Make sure the switch port and the device are both in the same VLAN • Try to connect to a different port
Cannot auto-negotiate the port speed.	Make sure that auto-negotiation is supported and enabled on both sides of the link (in both devices).

Appendix B: Specifications

The sections below list the features and product specifications for the IntraCore IC3624/48 switch.

Interfaces
- 24/48 RJ-45 connectors for 10/100 BASE-T
- 2/4 RJ45 Combo Ports for 1000 BASE T with 2

MiniGIBC/SFP Slots
- IEEE Auto Negotiation or manual configuration
- Reset button
- RS232 Console port

Status Indicators
- Power Operating status of the unit
- LED for port link/activity

Performance Specifications
- Wire-speed, Gigabit Ethernet Switch at 6.5Mpps
- Less than 20µs for 64-byte frames latency
- 4 Priority Queue with Weighted Round Robin (WRR)

Scheduling
- 8000 MAC address with auto-learning and aging
- Single-chip switch fabric non-blocking with on-board frame buyers

Management Specifications
- IEEE 802.1x Standard Port Access Control
- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1.W Rapid Spanning Tree Protocol
- IEEE 802.1 S Multiple Spanning Tree Protocol
- IEEE 802.1Q Tag VLAN (Up to 64)
- Port-based QoS (options High/Normal)
- Port Trunking - Manual as per IEEE802.3ad Link

Aggregation
- Port Mirroring
- System Log
- RFC 1157 SNMP v1, v2c
- RFC 1643 Ethernet Interface MIB
- RFC1493 Bridge MIB
- Web-based (IE, Mozilla, MacOS-Safari)
- Password access control
- Upgradeable firmware

Standards Compliance
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet
- IEEE 802.3ab 1000BASE-T Gigabit Ethernet
- IEEE 802.3x full-duplex flow control
- IEEE 802.3z 1000BaseSX over 50 micron multi-mode fiber
- TCP/IP, CSMA/CA with ACK
- FCC Class A, CE Mark

L2+ Management Specifications
- Command Line Interface/Web /Telnet
- GVRP VLAN Negotiation
- ACL for L2,L3 and L4
- SSl and SSH
- TACACS+ Client Authentication
- IGMP Snooping and IGMP Proxy
- DHCP Client and DHCP Relay

Physical
- Dimensions (WxDxH): 430 x 250 x 44 (mm), 16.9 x 7 x 1.7 (inch)
- Weight: 3.5 kg(6.625 lbs)

Environmental Specifications
- Power: Internal, auto-switching, 100 ~ 240 VAC, 50-60 Hz
- Operating Temperature: 0°C to 40°C (32°F to 104°F)
- Storage temperature: -20° to 70° C (-4° to 158°F)
- Relative Humidity: 10% to 90%, non-condensing
- Storage humidity: 95% maximum, non-condensing

System Requirements
- Category 5, 6 Network cable
- Single Mode, Multimode fiber
- Window IE browser, Netscape, Mozzila, MacOS Safari.

Modules
- Asante SFP1000SX
- Asante SFP1000LX
- Asante SFP1000LZ

Security
- 802.11x RADIUS Authentication
- Management Access Control List

Package Content
- 48-port + 4 Giga L2+ Switch (IC3648)
- Power cord
- Rack-mount kit
- Switch CD
- Warranty/Support Information card

Warranty
- Asante 3 Year Warranty

Asante Service
- Free 24x7 email contact, Mon-Fri on Call.

Appendix C: FCC Compliance and Warranty Statements

C.1 FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

C.2 Important Safety Instructions

Caution: Do not use an RJ-11 (telephone) cable to connect network equipment.

1. Read all of these instructions.
2. Save these instructions for later use.
3. Follow all warnings and instructions marked on the product.
4. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. Do not use this product near water.
6. Do not place this product on an unstable cart or stand. The product may fall, causing serious damage to the product.
7. The air vent should never be blocked (such as by placing the product on a bed, sofa or rug). This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
8. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
9. This product is equipped with a three-wire grounding type plug, which is a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your outlet. Do not defeat the purpose of the grounding type plug.
10. Do not allow anything to rest on the power cord. Do not place this product where people will walk on the cord.
11. If an extension cord is used with this product, make sure that the total ampere ratings on the products into the extension cord do not exceed the extension cord ampere rating. Also make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
12. Never push objects of any kind into this product through air ventilation slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
13. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to service personnel.

C.3 IntraCore Warranty Statement

Products: IntraCore IC3624/48

Subject to the limitations and exclusions below, Asante warrants to the original end user purchaser that the covered products will be free from defects in title, materials and manufacturing workmanship for a period of three years from the date of purchase. This warranty excludes fans, power supplies, non-integrated software and accessories. Asante warrants that the fans and power supplies will be free from defects in title, materials and manufacturing workmanship for one year from date of purchase. Asante warrants that non-integrated software included with its products will be free from defects in title, materials, and workmanship for a period of 30 days from date of purchase, and the Company will support such software for the purpose for which it was intended for a period of 30 days from the date of purchase. This warranty expressly excludes problems arising due to compatibility with other vendors' products, or future compatibility due to third party software or driver updates.

To take advantage of this warranty, you must contact Asante for a return materials authorization (RMA) number. The RMA number must be clearly written on the outside of the returned package. Product must be sent to Asante postage paid. In the event of a defect, Asante will repair or replace defective product or components with new, refurbished or equivalent product or components as deemed appropriate by Asante. The foregoing is your sole remedy, and Asante's only obligation, with respect to any defect or non-conformity. Asante makes no warranty with respect to accessories (including but not limited to cables, brackets and fasteners) included with the covered product, nor to any discontinued product, i.e., product purchased more than thirty days after Asante has removed such product from its price list or discontinued shipments of such product.

This warranty is exclusive and is limited to the original end user purchaser only. Proof of purchase is required. This warranty shall not apply to secondhand products or to products that have been subjected to abuse, misuse, abnormal electrical or environmental conditions, or any condition other than what can be considered normal use.

ASANTE MAKES NO OTHER WARRANTIES, EXPRESS, IMPLIED OR OTHERWISE, REGARDING THE ASANTE PRODUCTS, EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ALL WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. ASANTE'S LIABILITY ARISING FROM OR RELATING TO THE PURCHASE, USE OR INABILITY TO USE THE PRODUCTS IS LIMITED TO A REFUND OF THE PURCHASE PRICE PAID. IN NO EVENT WILL ASANTE BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES FOR THE BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, INCLUDING ECONOMIC LOSS, DAMAGE TO PROPERTY AND, TO THE EXTENT PERMITTED BY LAW, DAMAGES FOR PERSONAL INJURY, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY (INCLUDING NEGLI-GENCE). THESE LIMITATIONS SHALL APPLY EVEN IF ASANTE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR IF THIS WARRANTY IS FOUND TO FAIL OF ITS ESSENTIAL PURPOSE.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which vary from jurisdiction to jurisdiction.

Index

Cabling

- console 20
- Ethernet 18
- procedures 17

CLI

- advanced features 29
- global configuration mode 27
- history 31
- interface configuration mode 28
- privileged top mode 25
- top user mode 24
- understanding 24

Command

- configuration 27
- ethernet interface 28
- help 30
- history 31
- IGMP 49
- interface 28

Configuring

- Ethernet 28
- IGMP 48
- interface 28
- priority queuing 58
- Quality of Service 57
- rate limit 60
- SNMP Configuration, GUI 89
- traffic shaping interface 60
- VLAN 71
- weighted fair queuing 57

Connecting

- console 13, 20
- network 17
- PC 22
- power 17

Console

- baud rate 21
- interface 13

Default

- IP address 64
- password 13
- port-priority 45
- SNMP trap authentication 89
- SNMP write community 89
- spanning-tree 74, 75

Description 11

- front panel 11

Features 7

GUI

- front panel screen 63
- general information screen 64
- SNMP configuration 89
- software version 64
- VLAN configuration 71

Help

context sensitive 30
IGMP
configuration 48
host-query 49, 79
overview 48
Installation
hardware 14, 34, 109
into rack 15
mini GBIC 16
IP
assign addresses 64
configuration 64
multicast configuration 48
range 64
Managing
front panel screen 63
general information screen 64
information screen 63
IP multicast 48
Password
default 13
Priority Queuing
configuring 58
examples 59
monitoring 59
Quality of Service
configuration 57
priority queuing 58
traffic shaping 60
weighted fair queuing 57
Rapid Spanning-Tree
edge port 43
link type 43
port path cost 44
port priority 44
Rate Limit
configuring 60
examples 60
Requirements
airflow 15
environment 15
power 15
tools 15
Safety
guidelines 14
Security
SNMPv3 89
SNMP
traps 89
Spanning-Tree
default 45
Traffic Shaping
overview 60
Troubleshooting 138
VLAN
configuration, GUI 71
trunk 55
Weighted Fair Queuing

bandwidth 57
configuration 57
monitoring 57, 58, 59, 60